Functional Servicing and Stormwater Management Report
Eighth Line Erin

Eighth Line Erin
Subdivision
5431 Eighth Line, Erin

R.J. Burnside & Associates Limited
292 Speedvale Avenue West
Guelph ON N1H 1C4 CANADA

December 2018
300039324.0000

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1.0 Introduction and Background

R.J. Burnside & Associates Limited (Burnside) has been retained by Homes in the Hills Inc. (Client), specifically Francesco Labricciosa, to prepare a Functional Servicing and Stormwater Management (FSR/SWM) Report in support of the proposed Eighth Line Subdivision development, in the Town of Erin.

1.1 Site Description and Planning Context

The Eighth Line Subdivision is proposed to be located on Lot 14, Concession 9 (Part #2 & #3, 61R-1743), in the Town of Erin, Wellington County. The legal address for this subject site is 5431 Eighth Line and is generally located North of Eighth Line and East of HWY #124. The proposed development is approximately 25.6 hectares (ha) in area and is bounded by Main Street to the North-East and Delarmbro Drive to the South-East, with a proposed access point through Forest Ridge Road. Please see Figure 1, for the site location. The proposed development includes 33 lots with an average size of 2,400 square meters (m^2) per lot for single detached dwelling units, two cul-de-sacs, at the North and South ends, and a potential 6 meters (m) wide Emergency Access Road to the North to allow a trail connection to Main Street. The Concept Plan is included in Appendix A.

Burnside has been retained to review the existing infrastructure in respect to the proposed development to determine servicing opportunities and constraints, and to develop a Stormwater Management Plan.

1.2 Background Studies and Documentation

R.J. Burnside was retained by the client to complete a Hydrogeological Assessment, which will be submitted together with the FSR for Draft Plan Approval. The scope of work completed for the hydrogeological study was developed based on criteria provided by Credit Valley Conservation (CVC) in a document entitled Hydrogeological Assessments - Conservation Authority Guidelines to Support Development Applications (2013).

1.3 Existing Site Conditions

1.3.1 Topography

The property (Site) is located in the West Credit River subwatershed within CVC's jurisdiction, approximately 400 m North of HWY #124, and has an undulating terrain. There are high areas at the east and west end of the site at elevations of 430 m and 405m respectively. The low areas within the site and generally across the south limit of the site are at approximate elevation of 395 m.

1.3.2 Soil Conditions

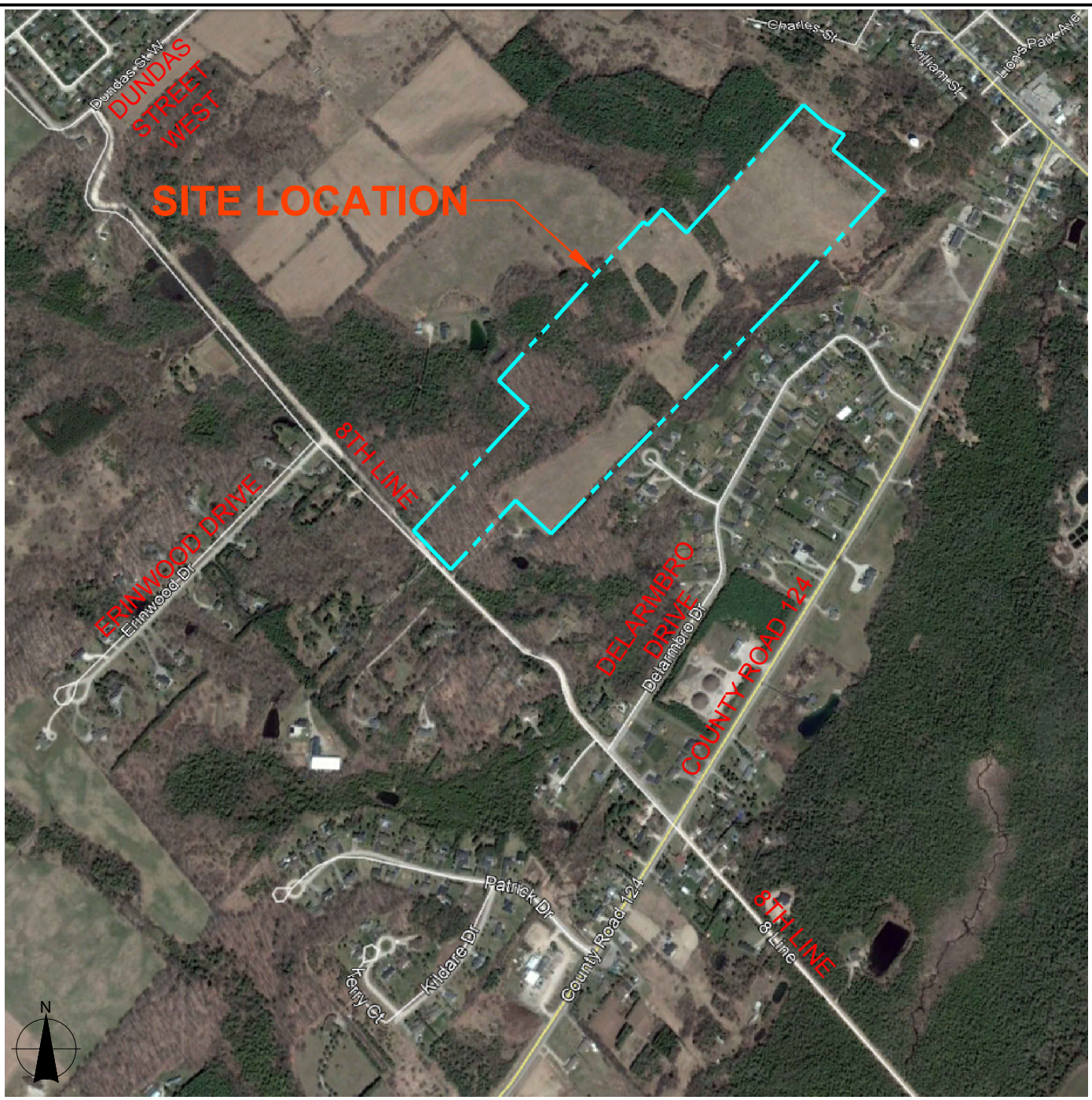
Surficial geology mapping published by the Ontario Geological Survey (2003) shows that the subject lands are underlain by ice-contact stratified deposits. Glaciofluvial deposits are mapped south of the subject lands and silty to sandy till is mapped east of the subject lands. The bedrock underlying the subject lands consists of dolostone from the Amabel Formation. Subsurface investigations completed by Burnside and stated within the Hydrological Assessment Report, that the surficial soils generally consist of 0.2 m to 1.5 m of topsoil or peat overlying sand ranging in thickness of 1.2 m to 3.8 m. Underlying the surficial sand are layers of silt, sandy silt and sand. Silty clay was encountered at depths of 1.52 m to 2.90 m. Limestone bedrock was encountered at depths of 5.3 m to 12.2 m.

1.3.3 Groundwater Conditions

Groundwater elevation data (June 2017) obtained from the monitoring wells and piezometers are shown on Figure 2, along with the interpreted groundwater elevation contours for the area. The Groundwater was found to be relatively shallow across the site, ranging in depth of between 0.03 m to 4.9 m below ground surface.

1.3.4 Environmental Features

The majority of the property is classified as Agricultural and Deciduous Forests and Swamp as the majority. It also includes Hedgerow, Coniferous Plantation and Mineral Cultural Meadow Land. The site is represented by existing woodland and evaluated wetlands under CVC, which are part of the provincially significant West Credit River Wetland Complex, and surrounding by a Greenbelt Town and Village Feature to the south, east and north, as it can be seen on the Ecological Land Classification Figure as well as the Natural Heritage Features Figure by Savanta in Appendix B. For more specific information, please refer to the Savanta Report.



KEY MAP OF ONTARIO

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HOMES IN THE HILLS, INC
ERIN, ONTARIO

Figure Title

ERIN EIGHTH LINE

SITE LOCATION PLAN

Drawn	Checked	Date	Figure No.
E.L.	S.R.	2018/12/04	**1.1**
Scale		Project No.	
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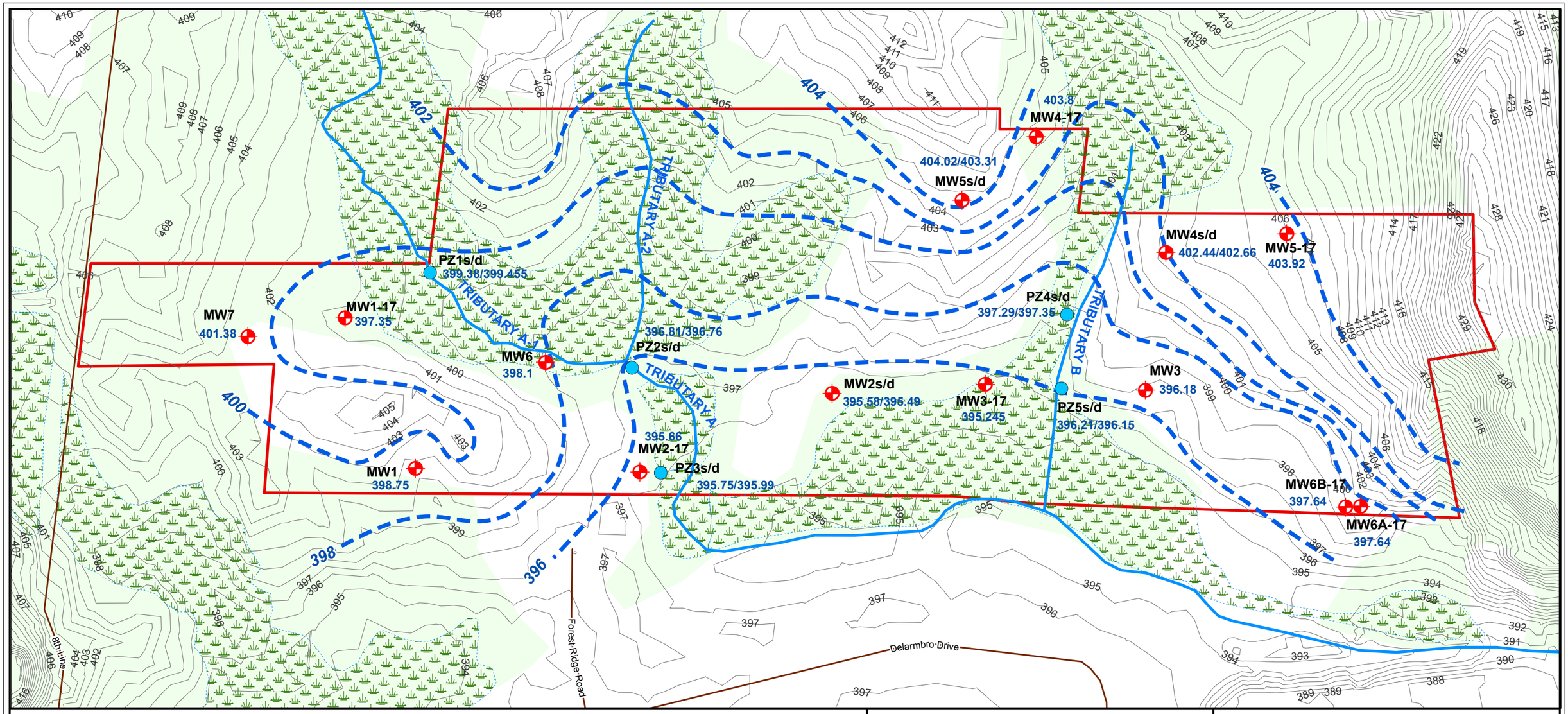
File: G:\039324 Erin Eighth Line Subdivision\07_Figures\Figure 1.1 Location Plan.dwg Date Plotted: December 4, 2018 - 1:20 PM



LEGEND

- SUBJECT LANDS
- WATERCOURSE (CVC, 2016)
- ROADWAY
- CONTOUR (1m intervals - masl)
- WOODED AREA
- WETLAND (MNR, 2013)
- MONITORING WELL
- DRIVE POINT PIEZOMTER
- INTERPRETED GROUNDWATER CONTOUR (masl)
- *397.39* MEASURED WATER LEVEL - masl (JUNE 26, 2017)

<BOL>Sources:</BOL>

1. Ministry of Natural Resources & Forestry, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. Topographical contours created from Ontario 2002 SWOOP data.

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Metres

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Client / Report

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HYDROGEOLOGICAL ASSESSMENT

Figure Title

INTERPRETED GROUNDWATER FLOW

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SK	SC	December 2018	1.2
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2.0 Transportation

The site will be serviced by an 8.0 m wide and 980 m long paved crowned road, going from South-West to North-East starting and ending with a Cul-de-Sac design at both ends and with an T-Intersection access point at 0+240. This intersection will connect to the existing Forest Ridge Road on the South-East property limits. A Plan and Profile of the proposed road alignment is contained within Drawing ROW1. The proposed Cul-De-Sac will comply with the Municipal Standard Drawing D.2 from the Town of Erin, which can be found in Appendix D. The proposed road design will require to incorporate a bridge structure between 0+650 and 0+680, with a span of 30 m in length, to minimize potential impacts to the PSW as established within the Savanta Report and seen on the Wetland Setback Survey Drawing within Appendix C.

A 20 m Non-Standard Municipal Right of Way (ROW) as seen in Figure 3, is to be used to limit the disturbance of existing wetland, especially at an existing woodland pinch point between chainage 0+300 to 0+400 of the proposed road alignment (see Drawing ROW1).

A Road Cross Section for the proposed ROW includes a 4.0 m wide paved through lane in each direction, a 1.50 m wide sidewalk on the South side of the corridor, curb and gutter (as per OPSD 600.40) as well as ditches on both sides with a minimum depth of 150 mm. For additional information concerning service and tree locations, including widths within the ROW please see the Proposed Road Cross Section within Figure 3.

Coordination with the Town is required to confirm the design requirements for the new proposed R.O.W.

2.1 Emergency Access Road

A 6.0 m wide Emergency Access Road is proposed at the end of the North-East Cul-de-Sac, connecting to the existing trail system just South of the Water Tower, which allows an access point to Main Street. Burnside and Savanta has completed a preliminary review of the location and condition of a proposed connection and have confirmed that the existing trail system can be used as an Emergency Access Road with minor required changes. Knock-down bollards are proposed at both access locations to allow safe pedestrian access, which would be only lowered to allow emergency vehicles to pass through in the case the primary access at Forest Ridge Road can not be used.

Coordination with the Town is required to confirm the design requirements of the proposed Emergency Access Road.

2.2 Existing Intersection Improvements

The existing Cul-de-Sac located at the end of Forest Ridge Road, will require adjustments as it will function as a through lane followed by the T-Section connection into the new proposed Eighth Line Subdivision.

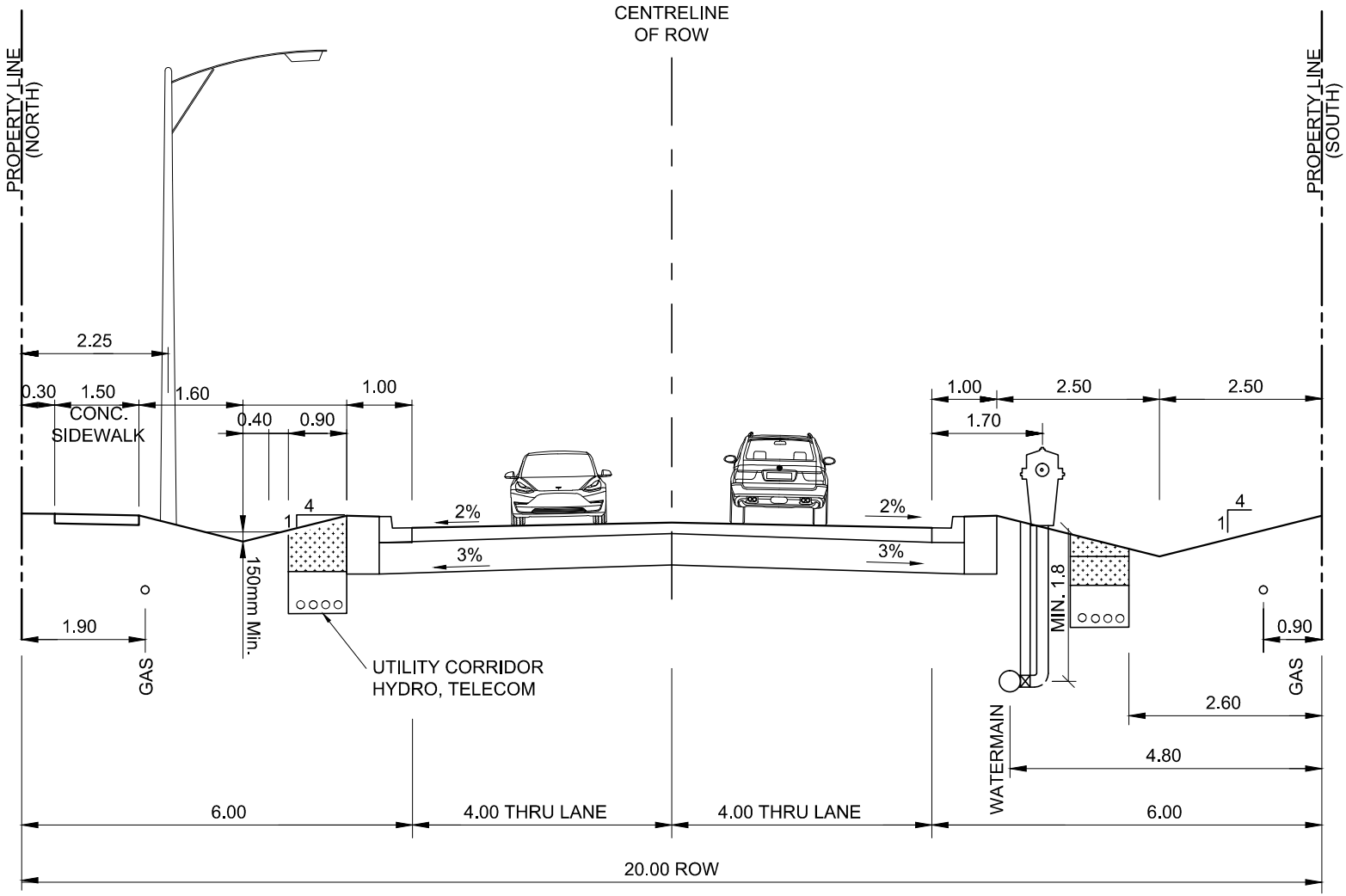

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Figure Title

ERIN EIGHTH LINE

PROPOSED STREET CROSS SECTION
20.0m R.O.W. - 2 LANES

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Drawn	Checked	Date	Figure No.
E.L.	S.R.	2018/11/30	**2.1**
Scale		Project No.	
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File: G:\039324 Erin Eighth Line Subdivision\07_Figures\Figure 2.1 20m ROW.dwg Date Plotted: December 5, 2018 - 12:54 PM

3.0 Water Distribution

3.1 Existing Water Infrastructure

An existing 150 mm water main is servicing Forest Ridge Road, which is fed by a 200 mm watermain on Delarmbro Drive, creating a connection between Eighth Line on the south side and Wellington Road (HWY #124) to the east. In addition, the existing Water Tower is located north of the proposed development, which is connected by 300 mm with Main Street to the north.

3.2 Proposed Water Distribution Layout

The internal water distribution system will be designed in accordance with the current Ministry of Environmental Climate and Parks (MECP) Guidelines, connecting our site at the south-east boundary limits, with the existing 150 mm watermain at the end of Forest Ridge Road The locations of the proposed watermain can be seen with the Village of Erin Water Distribution Plan in Appendix E. The proposed watermain will follow the proposed road alignment along the south side up to each Cul-de-Sac, where it will be connected to a proposed fire hydrant at each end. Insulated valves will be provided on the property line for each road service connection to the new proposed water main, including the introduction of two close valves on the T-Intersection between the new proposed road and Forest Ridge Road.

A hydrant flow test will be performed prior the detail design stage to ensure that adequate water pressure and fire flows can be provided throughout the entire site. In the case the water pressure and flow characteristics won't meet the required outcome, a loop connection can be introduced to the existing water tower through the proposed emergency road located at the north-east Cul-de-Sac, which could also benefit the existing water pressure and flow characteristics along Delarmbro Drive and Forest Ridge Drive. During the initial stages of Draft Plan Approval, the fire flow protection and storage provision will be reviewed with the Town of Erin.

4.0 Wastewater Servicing

There is currently no existing municipal wastewater system in place, so that the existing neighbourhood lots along Forest Ridge Drive and Delarmbro Drive use individual Septic Systems in place, which are all located within each lot boundary.

The proposed development consists of 33 "estate" lots, ranging in size from 2,016 – 3,211 m^2. Municipal sanitary sewer services are not available in this area, and a communal sewage system is not desirable. Therefore, sanitary servicing will be provided by privately owned individual onsite sewage systems, one system for each lot to be developed. These treatment systems shall be designed in accordance with current Ministry of the Environment Guidelines and Town of Erin standards. Individual sewage

systems shall be designed in accordance with the Ontario Building Code Regulation No. 4031 97 as amended.

4.1 Background Information

A Municipal Class Environmental Assessment Report was undertaking, for the Town of Erin, to identify and evaluate design alternatives and recommend a preferred alternative solution for Wastewater Collection, Treatment and Disposal for Erin Village, Hillsburgh and portion of the surrounding lands within the community boundaries. The report has been prepared as part of the Town of Erin Urban Center Wastewater Servicing Environmental Assessment (UCWS EA) and present an overview of the Servicing and Settlement Master Plan (SSMP). The SSMP concluded that a wastewater collection system conveying all wastewater flows to a single Wastewater Treatment Plant (WWTP) was the preferred solution to meet the existing community's wastewater servicing needs and support future population growth. The SSMP further recommended that the WWTP be situated south east of Erin Village, with treated WWTP effluent being discharged to the West Credit River between 10th Line and Winston Churchill Boulevard.

The Environmental Assessment (Phase 3 and 4) by Ainley (Consulting Engineers Planners) proposed the possibility of connecting new growth areas (ER-15) identified in the Town Official Plan by gravity sewer through Charles Street or William Street followed by a connection to Main Street. There is currently no gravity sewer system proposed along Forest Ridge Drive nor Delarmbro Drive. The Urban Centre Wastewater Servicing Plan is shown within Appendix F.

A gravity sewer system going through the hilly terrain at the north-east site boundaries, where the existing water tower is located, would be prohibitively deep (10-20 m), or would require a pumping station. In addition, within this site, a gravity sewer would cross two low areas, including a PSW. Considering these constraints, a gravity sewer would not be appropriate and individual treatment systems are proposed.

4.2 Site and Subsurface Conditions

The topography of the Site ranges from 434 masl at the northeastern property boundary to 395 masl in the lowering areas that traverse the central portion of the site. Surface water drainage from the south portion generally drains northward and drainage from the north being generally south. The surficial soils generally consist of 0.2 m to 1.5 m of topsoil or peat overlying sand ranging in thickness of 1.2 m to 3.8 m. Underlying the surficial sand are layers of silt, sandy silt and sand. Silty clay was encountered at depths exceeding 1.5 m in two locations, and bedrock was encountered at depths of exceeding 5 m in two locations. A shallow groundwater table was observed across much of the subject lands, with an average depth to water table of approximately 1 m observed across much of the site. The borehole logs completed during subsurface investigations are provided in Appendix G.

Therefore, the shallow sand layer underlying the topsoil layer will be the receiving soils for the onsite sewage treatment system. For preliminary design purposes a T-time value of 10 min/cm has been assigned. However, given the elevated water table found across much of the site, raised or partially raised disposal beds will likely be required in some areas. We have completed our preliminary analysis based on a raised leaching bed discharging to underlying sandy soils. This is considered to be a conservative approach and will provide a large conservative footprint for the leaching bed. Site specific test pits should be completed to confirm these assumptions during detailed design or prior to building permit application.

4.3 Sewage Quantity and Quality

The daily design sewage flows for individual lots have been calculated according to Part 8 of the Ontario Building Code. For preliminary sizing purposes, Burnside considered a typical size home for an estate lot within this area, assuming that the homes to be constructed will consist of 4 bedrooms and 3.5 bathroom dwelling units, with a total finished floor area of approximately 325 m^2 (3,500 ft^2), excluding the finished basement floor area.

Table 1 shows the proposed fixtures and corresponding fixture unit count according to Table 7.4.9.3. of the Ontario Building Code (OBC) for the proposed homes.

Table 1: Proposed fixtures for Renovated Dwelling

Proposed Fixture for Heritage Barn	Proposed Number of Fixtures	Fixture Units per Fixture	Total Fixture Units
Bathroom Group (flush tank)	3	6	18.0
Bath tub	1	1.5	1.5
Toilet	1	4	4.0
Sinks (includes kitchen, laundry etc).	4	1.5	6.0
Clothes Washer	1	1.5	1.5
Dishwasher	1	1.5	1.5
Total Number of Fixture Units			32.5

Sewage flow calculations have been completed according to Table 8.2.1.3.A of Part 8 of the OBC. Table 2 summarizes the total daily sanitary sewage flows for this facility.

Table 2: Proposed Maximum Day Sewage Flows

Description	Unit	Flow Per Unit (L/day)	Total Units	Total Flow (L/day)
Base Flow for 4 bedroom dwelling	n/a	2,000	1	2,000

Description	Unit	Flow Per Unit (L/day)	Total Units	Total Flow (L/day)
Additional Flow for:				
i) Each bedroom over 5, or	bedrooms	500	0	0
ii) Area over 200 m^2				
a) Each 10 m^2 over 200 m^2 to 400 m^2	125 m^2	100	13	1,300
iii) Fixture Units over 20	F.U.	50	13	625
Total Daily Design Sanitary Sewage Flow				3,300

Therefore, for preliminary sizing purposes a total daily design sanitary sewage flow of 3,300 L/day will be utilized. Should larger homes be proposed alternative treatment options may have to be pursued. Raw sewage is expected to be of typical domestic strength waste.

4.4 Proposed Wastewater Service System Options

The Ontario Building Code regulates the design and construction of small, privately owned onsite sewage systems across the province of Ontario. As soil, groundwater and bedrock conditions vary widely across the province, several options for onsite sewage systems are permissible. The most common type of individual sewage system is a conventional septic tank and leaching bed system, which is a simple, reliable and effective method of sewage treatment and disposal for individual residences where site conditions are suitable.

In a conventional system, the septic tank is primarily responsible for separating the solids, including settleable solids and fats, oils and greases, from the liquid portion of the wastewater. The liquid portion is then discharged to a leaching bed, where it is further treated by a combination of physical, biological, and chemical processes in the soil. For systems where only a septic tank is used, two leaching bed options may be considered, an absorption trench type system or a filter bed. Conventional septic tank/leaching bed systems will meet the requirements of the nitrate impact assessment discussed above. Additional leaching bed options may be considered with the use of an advanced treatment unit.

4.4.1 Septic Tank Size

The minimum required septic tank size (according to current OBC criteria) is two times the daily design sewage flow for residential applications, and three times the daily design sewage flow for non-residential applications. Regardless of daily sewage flow, the minimum allowable septic tank size is 3,600 L. Therefore, for a design flow of

3,300 L/day, each home would require a septic tank with a working capacity of at least 6,600 L. A 6,800 L tank is likely the next commonly available size. A small pump chamber would be required to convey the effluent to the bed, since raised beds are recommended.

4.4.2 Absorption Trench Leaching Beds

Conventional leaching beds consist of a system of absorption trenches constructed using perforated piping and stone. The trenches are separated from each other either by the native soils, if constructed in ground, or by imported fill, if constructed in a raised manner. For the subject development, it has been assumed that raised beds will be required due to the elevated water table. This may require the use of a pump to deliver septic tank effluent to the leaching bed.

Conventional absorption trench systems are reliable and well understood by the onsite sewage system industry, and are well suited to the sandy soils encountered on the subject property. Maintenance for these types of systems is usually minor and limited to periodic removal of the accumulated solids in the septic tank. However in a raised configuration, they require a very large footprint to accommodate suitable loading rates on the receiving soils, and achieve additional requirements for raised systems such as a 15 m “mantle”. Imported septic sand would be required to construct the system. According to our preliminary analysis, a footprint of approximately 730 m^2 would be required for the preliminary design sanitary sewage flow of 3,300 L/day.

4.4.3 Filter Beds

A filter bed system is a specific type of bed that can be used as an alternative to a conventional absorption trench leaching bed. It can also be used with just a septic tank, and would meet the requirements of the nitrate impact assessment. A filter bed consists of a perforated pipe distribution network installed in a common layer of stone overlying a layer of specified filter sand material. The filter sand material is a specially washed sand that must meet a required grading specification. Effluent percolates through the filter sand material where is undergoes physical, biological and chemical processes before entering the underlying native soil. Filter beds may also be constructed in-ground, or raised, as site conditions dictate, which may also require a pump to dose the bed. Again, for the subject development we have assumed that a raised bed will be required due to the elevated groundwater table noted on portions of the site.

Filter beds are also considered reliable and are very common in the subject area. They have a more compact footprint than a conventional absorption trench leaching bed and can provide significant space savings. Filter sand may be more expensive than septic sand, but smaller quantities will likely be required for the filter bed. According to our preliminary analysis, a footprint of approximately 480 m^2 would be required for the preliminary design sanitary sewage flow of 3,300 L/day.

4.4.4 Advanced Treatment Units

The use of proprietary advanced treatment systems may also be considered. A conventional septic tank/leaching bed system has a limited ability to remove nitrogen from the wastewater, which has the potential to affect groundwater resources. Proprietary advanced treatment units treat wastewater to a higher degree than a septic tank, improving effluent quality of the wastewater prior to discharging it to the leaching bed. This improved effluent quality allows for a reduced leaching bed size, or the construction of a shallow buried trench or Type A dispersal bed, which may be advantageous if space constraints exist.

Proprietary advanced treatment systems must undergo rigorous standardized testing to demonstrate that they can reliably achieve high effluent quality and are approved for use in Ontario through the OBC. There are several options available for use, including the Norweco Hydrokinetic unit, the Waterloo Biofilter, the Biobarrier treatment unit and the Ecoflo unit.

Advanced treatment units have made significant gains in the onsite industry in the last ten years, and local installers are very familiar with the various products. However, the treatment units themselves are generally more costly to install. In addition, the OBC requires that the property owner enter into an annual maintenance agreement with an authorized service person to ensure that the system is operating according to design principles. It also requires more homeowner education and understanding of system use and maintenance requirements.

Although advanced treatment is not required to satisfy the nitrate impact assessment for this site, the smaller footprint for the leaching bed may be desirable. According to our preliminary analysis, a footprint of approximately 70 m^2 would be required for the preliminary design sanitary sewage flow of 3,300 L/day, if the bed is constructed as a Type A dispersal bed.

4.5 Operation and Maintenance

All septic systems require proper operation and maintenance in order to function in their intended manner. This includes periodic removal of accumulated sludge and scum from the septic tank, as well as proper care not to put items into the system that could be harmful (e.g. wipes, harsh cleaning products or chemicals, non-biodegradable articles, etc.).

For a system that employs a treatment unit, the OBC requires that the owner have a maintenance agreement with the manufacturer of the treatment unit or their authorized agent. Annual maintenance visits and sampling of treated effluent are required.

4.6 Setback Distances

The OBC regulates mandatory minimum setback distances for various components of onsite sewage treatment systems to site features, including wells, surface water features, structures and property boundaries. All setback distances mandated by the OBC must be maintained on the individual properties, to site features both on and off the subject lot. Table 3 below shows the minimum mandatory setback distances for onsite sewage systems.

Table 3: Minimum Mandatory Setback Distances for Onsite Sewage Systems.

Object	Minimum Clearance for Septic Tank (m)	Minimum Clearance for Distribution Piping (m)
Structure	1.5	5
Well with a watertight casing to a depth of at least 6 m	15	15
Any other well	15	30
Lake, Pond, Reservoir, River, Spring, Stream	15	15
Property Line	3	3

4.7 Preferred Sewage Servicing Option

The preferred sewage system for this development is a filter bed. A filter bed does not require additional treatment beyond a septic tank, and has a slightly smaller footprint than a conventional absorption trench system. It is a reliable, common system in the area and is well suited to the naturally occurring sandy deposits found in the area. It meets the requirements of the nitrate impact assessment without additional treatment, and provides a conservative assessment of the footprint required. It should be noted that the footprint required may be significantly reduced if a raised system is not required, i.e., the ground water table is not elevated. Test pits should be completed on each lot prior to detailed design to confirm preliminary design assumptions.

Although the use of an advanced treatment system can present a significant space savings, capital costs and ongoing operation and maintenance costs are anticipated to be higher than for the construction and operation and maintenance of a filter bed. Future individual property owners of the smaller lot will need to install an advanced treatment unit in order to gain additional amenity area on the lot, they may do so, provided it meets the requirements of the OBC. The use of an advanced treatment system may also allow larger homes to be developed, or to make room for site specific needs such as decks, pools, gazebos etc. Therefore, for preliminary development purposes, a filter bed is the preferred option for the bigger lots, as it meets the effluent criteria required and provides a conservative estimate of the space required to service the lot. A Wastewater Septic System Layout Plan can be seen in Drawing SAN1.

5.0 Grading and Storm Drainage

5.1 Site Grading

The functional site grading design is depicted on Drawing SIT1, and addresses the following constrains:

- Conform to the Town of Erin's grading criteria.
- Matches existing boundary grading conditions (interim conditions).

Considers grading limitations within the given dripline setbacks.

- Proposed lots classified as Lookout (Back-to-Front), Walkout as well as Split Drainage, were used throughout the entire site.
- Provides a vertical grade elevation foundation for the new proposed road with three proposed low points within, to allow overland flows to discharge major flows to the existing drainage system.
- Introduction of a typical building layout (approximately 3,500 m^2) and an approximately 15.0 m long driveway, as it is currently represented within the surrounding neighbourhood subdivisions, for better visualization.

5.2 Existing Storm Drainage

Storm drainage is conveyed via sheet flow across the site. The site is composed of a mixture of forested area and crops and discharges in four general locations. Figure 4 provides an overview of the existing drainage patterns and catchment boundaries of the subject property and contributing external areas. The existing drainage area parameters are summarized in the table below and are based on the CVC standard parameters.

Table 4: Existing Drainage Catchments

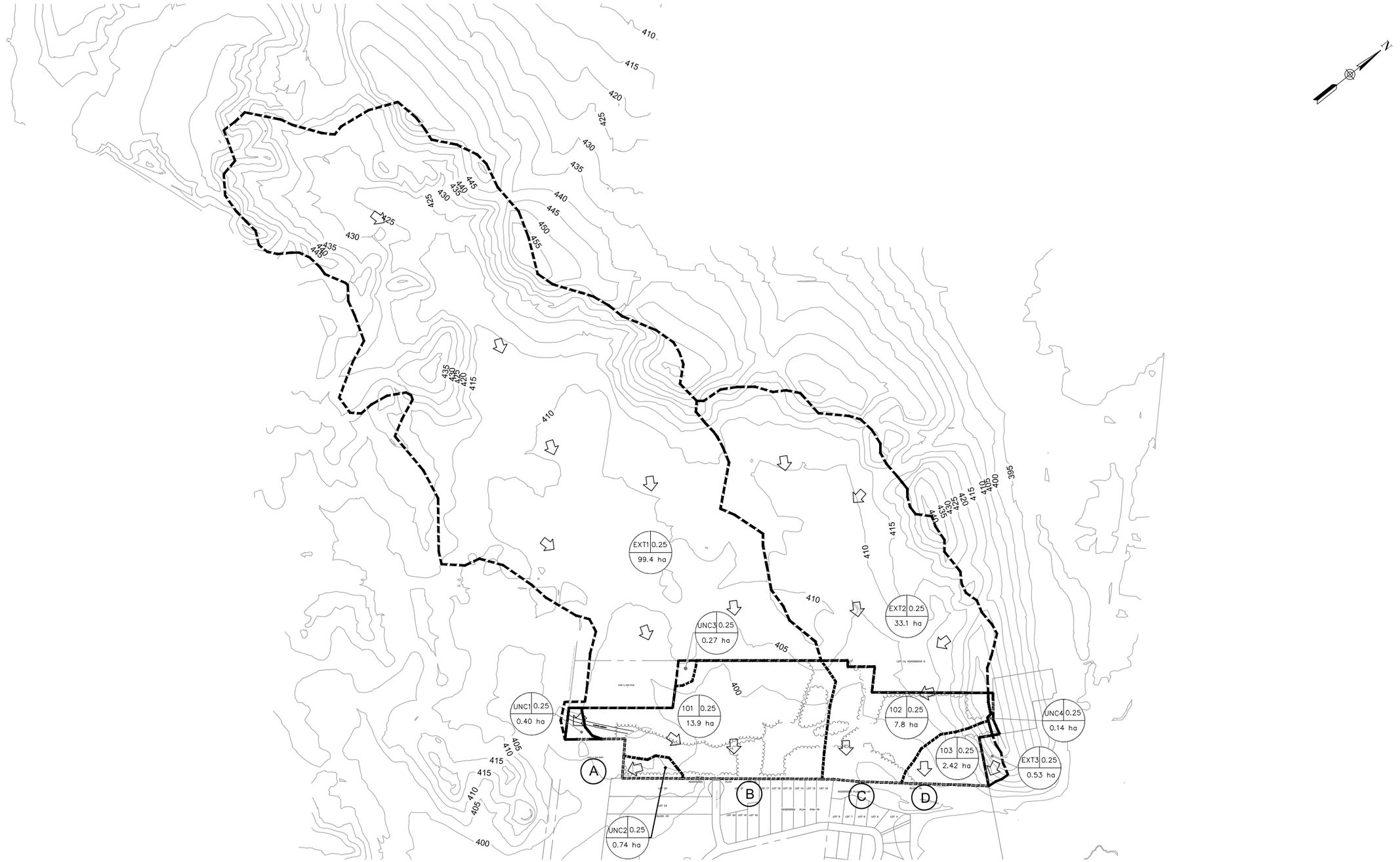
Discharge Point	Catchment ID	Catchment Area (ha)	CN	IA (mm)
A	UNC-1	0.40	60	10
	UNC-2	0.74	69	6.4
B	EXT-1	99.4	53	8.5
	101	13.9	64	8.3
	UNC-3	0.27	60	10
C	EXT-2	33.1	51	7
	102	7.8	56	6
D	EXT-3	0.53	36	10
	103	2.42	64	4.4
east	UNC-4[1]	0.14	60	10
	TOTAL to West Credit River	158.56	-	-

[1] This catchment remains the same in pre and post development

The catchment specific parameters have been assigned based on existing land use as well as the soil group. Specifics regarding soil groups have been sourced from the geotechnical report (as described in previous sections) and Ontario Soil Maps. With this information it was concluded that soils are Soil Group B on western portion of the site and Soil Group A on the eastern portion. Further detail regarding the parameter is in Appendix H.

There are four areas of the site that are labelled as uncontrolled because they do not drain to the obvious low points on the site. The pre-development drainage plan shows that the site accommodates 133 ha of existing external drainage area from the forested land / crops northwest and east of the site.

There is a low point in the form of a depression that runs relatively parallel to the southeast property line for the site, three out of four of the discharge points reach this low point. Discharge Point A drains southwest but is still ultimately conveyed to the West Credit River.



BURNSIDE

Figure Title

ERIN EIGHTH LINE

PRE-DEVELOPMENT DRAINAGE PLAN

Client

HOMES IN THE HILLS INC.
ERIN, ONTARIO

Drawn	Checked	Date	Figure No.
KT	AF	18/12/07	**FIG 4**
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5.3 Proposed Storm Drainage

The proposed drainage approach for the subject property is intended to mimic existing pre-development conditions as feasible as demonstrated on Figure 5. The four discharge locations have been maintained and there are minor changes in the drainage patterns from pre-development conditions. Each of the existing catchments on the site have been further delineated under post development conditions to reflect the proposed grading design shown on Drawing GRD1. Total areas to a discharge points have changed slightly, and the imperviousness has increased which is captured in the updated parameters. Post development drainage parameters are summarized in the table below. Further detail pertaining to the parameters is included in Appendix H.

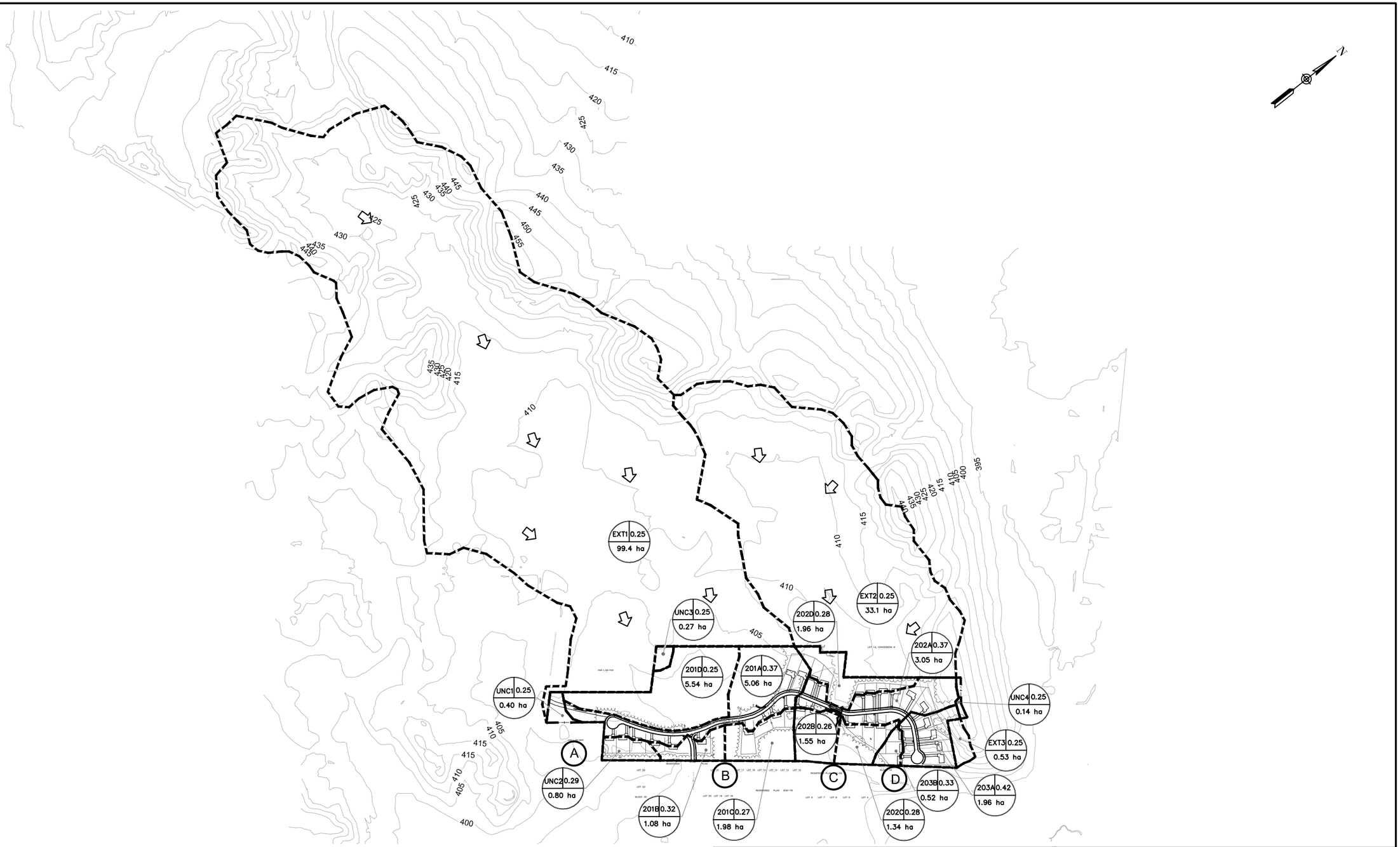
Table 5: Post Development Drainage Catchments

Discharge Point	Catchment ID	Catchment Area (ha)	CN	IA (mm)	TIMP (%)
A	UNC-1	0.40	60	10	-
	UNC-2	0.80	69	6.6	-
B	EXT-1	99.4	53	8.5	-
	201A	5.06	62	-	24.0
	201B	1.08	68	7.3	-
	201C	1.98	66	7.5	-
	201D	5.54	60	10	-
	UNC-3	0.27	60	10	-
C	EXT-2	33.1	51	7	-
	202A	3.05	51	-	24.9
	202B	1.55	41	9	-
	202C	1.34	47	7.7	-
	202D	1.96	45	8.2	-
D	EXT-3	0.53	36	10	-
	203A	1.96	53	-	31.3
	203B	0.52	58	5.5	-
east	UNC-4[1]	0.14	60	10	-
	TOTAL to West Credit River	158.56	-	-	-

[1] This catchment remains the same in pre and post development

Catchments with an imperviousness greater than 20% have been modeled as a STANDHYD. Remaining catchments are modeled as a NASHYD. The different parameters listed in the table above represent the inputs required for the different modeling calculations.

As outlined in the table above, the area draining to the West Credit River is the same under pre and poste development conditions.



BURNSIDE

Figure Title

ERIN EIGHTH LINE

POST DEVELOPMENT DRAINAGE PLAN

Client

HOMES IN THE HILLS INC.
ERIN, ONTARIO

Drawn	Checked	Date	Figure No.
KT	AF	18/12/07	**FIG 5**
Scale		Project No.	
1:10,000		300039324	

File: \\elmo\Shared Work Areas\039324 Erin Eighth Line Subdivision\04_Preliminary\003_ProductionDwg\039324 PRE-POST DEV SWM.dwg Date Plotted: December 7, 2018 - 11:10 AM

6.0 Stormwater Management

Stormwater management practices are planning and technical measures typically implemented to manage the quality and quantity of urban runoff. The Ministry of Environment has developed guidelines for the control of stormwater runoff from proposed developments (Stormwater Management Planning and Design Manual, Ministry of Environment, MOE, March 2003). The Town of Erin has developed stormwater management criteria through the establishment of Municipal Servicing Standards. Additionally, CVC specifies water retention and stormwater management parameters for development properties. These criteria were used to establish the stormwater management design for the site.

6.1 Quantity Control

CVC standards require that post-to-pre controls be applied to the flow discharging from the site. As per Town of Erin standards, the stormwater management analysis has been completed for the 5-year through to 100-year storms.

The catchments listed in the table from the previous section have been delineated based on their discharge location on the site. Catchments were delineated based on the proposed grading as well as the layout of the site plan. Delineation was completed this way to allow for a simple post-to-pre flow comparison, and to understand where controls need to be implemented if required.

The following table compares the flows from pre-development, post development uncontrolled and post development with controls. The comparisons are completed based on the four discharge locations from the site. The SWMHYMO modeling completed to determine the flows in included in Appendix H.

Table 6: Output Flows from Site

Design Storm	Discharge Point	Pre-Development (m^3/s)	Post Development - uncontrolled (m^3/s)	Post Development – controlled (m^3/s)
5 year	A	0.045	0.045	0.041
	B	0.960	0.942	0.911
	C	0.507	0.482	0.442
	D	0.096	0.092	0.053
10 year	A	0.067	0.068	0.064
	B	1.491	1.454	1.423
	C	0.779	0.737	0.697
	D	0.141	0.139	0.100
25 year	A	0.099	0.101	0.097
	B	2.296	2.228	2.197

Design Storm	Discharge Point	Pre-Development (m^3/s)	Post Development - uncontrolled (m^3/s)	Post Development – controlled (m^3/s)
	C	1.191	1.123	1.083
	D	0.206	0.209	0.169
50 year	A	0.125	0.128	0.124
	B	2.999	2.902	2.871
	C	1.550	1.458	1.418
	D	0.261	0.267	0.228
100 year	A	0.152	0.156	0.152
	B	3.711	3.589	3.558
	C	1.916	1.795	1.755
	D	0.317	0.328	0.289

As shown in the table above, under post development conditions without controls, the flow exceeds pre-development levels at some discharge points. To rectify this, controls in the form of low impact development (LIDs) are proposed. The proposed controls are demonstrated on Figure 5.

Each of the lots will have two infiltration trenches, one for the drainage from the front of the roof and one for the drainage from the back of the roof. These trenches will be sized to hold and infiltrate the 25mm event within a 24-hour time period. A typical cross section of the infiltration trench is included on Figure 6. A LID, in the form of a bioretention cell, is proposed in the centre of the eastern cul-de-sac. As per the grading, this cul-de-sac is in a low point, making it an excellent location for a bioretention cell. The bioretention cell will also be sized to hold and infiltrate the 25 mm event. Calculations and modeling for the LIDs are included in Appendix H. As previously mentioned, the groundwater levels on the site are near the surface. During detailed design, the proposed locations of the infiltration trenches on the lots will be further refined. Ideally, the trenches will be located on the high portion of the lot to allow for a 1.0 m separation from the bottom of the trench to the seasonally high groundwater elevation.

The proposed ROWs include a ditch on either side of the ROW to collect and convey the water from the roadway. As a part of detailed design, the ditches will be sized for the 100 year storm event and have been designed convey the flow to existing low points on the site, as defined by the drainage areas that have been delineated. It should be noted that these ditches will act as a route channel to convey flow to the discharge point. The post development (controlled) modeling does not include the route channels which would further attenuate flows. Therefore, the flows presented in the table above are conservative.

Through the implementation of LIDs, the proposed development meets CVC's requirement of post-to-pre controls.

6.2 Quality Control

As per CVC requirement, 80% of the total suspended solids (TSS) loading on an annual basis from all runoff leaving the site is to be removed.

The proposed development does not produce a large amount of runoff that requires TSS to be removed. The large majority of the area on the site is a pervious surface, forested or grass. Rainfall that lands on a pervious surface is considered clean. Similarly, rainfall from a rooftop is considered clean. The only runoff from the site that requires TSS removal is from driveways and asphalt within the ROW because it is exposed to pollutants as a result of vehicular traffic.

Runoff from the driveways will be conveyed to the ROW, therefore all contaminated stormwater discharges to the ditches on either side of the ROW prior to leaving the site. The ditches will filter the water through the vegetation which will remove TSS. In the majority of catchments, water will flow from the roadsides ditches to naturalized land in the form of a forest prior to being released from the site. This natural land will act as a vegetated filter strip and further remove TSS. Based on this, the proposed design will, at a minimum, remove 80% of the TSS from all runoff leaving the site.

6.3 Water Balance

In order to assess potential land development impacts on the local groundwater conditions, a detailed water balance analysis has been completed to determine the pre-development recharge volumes (based on existing land use conditions) and the post-development- recharge volumes that would be expected based on the proposed land use plan. The detailed monthly water balance summary can be found within the Hydrogeological Assessment Report.

While the proposed development does increase the imperviousness of the site, the majority of the site will remain as pervious land which a will allow the water balance to be maintained at the pre-development level. As previously mentioned, infiltration trenches are proposed to aid in achieving the quantity control requirements for the site, however, the trenches will also work to achieve the required water balance through the infiltration of roof water. Similarly, the LID proposed in the cul-de-sac will infiltrate water from a portion of the ROW.

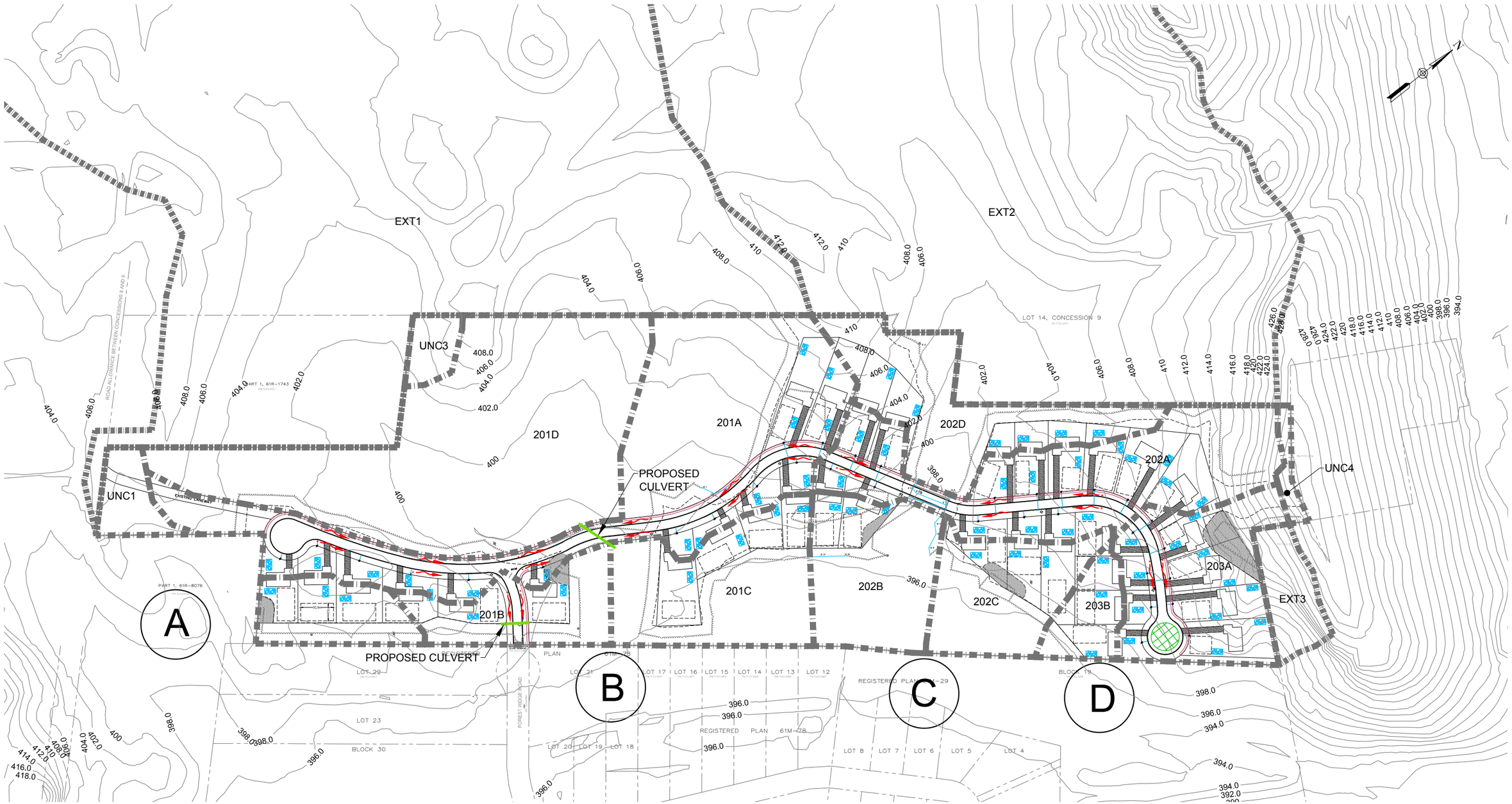
6.4 External Drainage Conveyance

All external drainage conveyance pathways will be maintained and infrastructure will be sized to ensure flow is unobstructed.

Under existing conditions, External Area 1 discharges to an existing culvert beneath a pathway constructed by a farmer. This flow path will remain under post development conditions. The size and slope of the culvert will be confirmed as a part of detailed design.

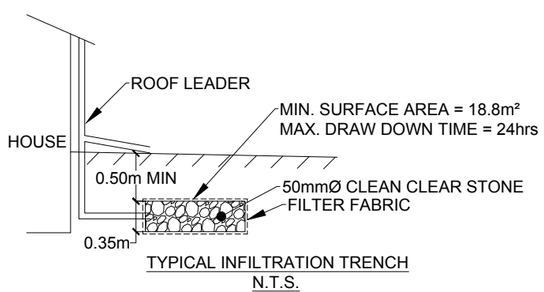
External Area 2 is currently conveyed to an existing low point on the site. As part of the proposed development, a ROW will be constructed in the area of the existing low point. To maintain the conveyance of the existing flows through this area, a bridge will be constructed and is oversized to convey the major storm flows from External Area 2 as well as flows from the developed site.

External Area 3 is a small area that will discharge directly to lots under post development conditions. The external flow will be conveyed via the side lot swales and will not pose a risk to the dwellings.



LEGEND

- PROPOSED ROADSIDE DITCH
- PROPOSED CULVERT
- POST DEVELOPMENT DRAINAGE AREA
- PROPOSED INFILTRATION TRENCH
- PROPOSED LID



TYPICAL INFILTRATION TRENCH
N.T.S.

BURNSIDE

Client
HOMES IN THE HILLS INC.
ERIN, ONTARIO

Figure Title
ERIN EIGHTH LINE
PROPOSED STORMWATER MANAGEMENT PLAN

Drawn	Checked	Date	Figure No.
KT	JS	18/12/07	**FIG 6**
Scale		Project No.	
1:3500		300039324	

File: \\elmo\Shared Work Areas\039324 Erin Eighth Line Subdivision\04_Preliminary\003_ProductionDwg\039324 PROP SWM PLAN.dwg Date Plotted: December 6, 2018 - 4:10 PM

7.0 Erosion and Sediment Control

The Erosion and Sediment Control Plan for the site will be designed in conformance with the Town of Erin, CVC, Wellington County and the OPSD. Erosion and sediment control will be implemented for all construction activities including topsoil stripping, foundation excavation and stockpiling of material.

The following erosion and sediment control measures will be installed and maintained during construction:

- Prior to grading, a temporary sediment control fence will be placed around the perimeter of all areas that will be disturbed.

Sediment traps will be provided to ensure that the existing streams on-site will not experience any negative affects during the construction period.

- Gravel mud mats will be introduced at all construction access points to minimize off-site tracking of sediment.
- Sediment control ponds may be required depending on the total area of the undisturbed site and number of natural outlets.
- All temporary erosion and sediment control measures will be routinely inspected and repaired during construction. Temporary controls will not be removed until the areas they serve are restored and stable.

Erosion and Sediment Control drawings will be completed as part of the detail design.

8.0 Conclusion and Recommendations

The report has presented a functional design of site servicing and grading at the proposed development. Further refinement will be performed at the detail design stage. Functional design for the proposed development can be summarized as follows:

- The proposed storm drainage system will be designed in compliance with the Wellington County Guidelines, MOECC Guidelines, and the Town of Erin Design Standards.
- The introduction of the 30 m long span bridge between STA. 0+650 to 0+680 will minimize the impact of the existing external drainage path, including the protected wetlands on site.
- Water service will be accomplished by connecting to the existing 150 mm diameter watermain on Forest Ridge Road. A watermain loop can be introduced by connecting to the existing watermain located at the Water Tower to enhance the fire flow and water pressures for the existing dwelling units along Delarmbro Drive and HWY 124

- The development will be serviced by septic systems on each individual lot. Due to the size limitations of specific lots an advanced sanitary treatment system is recommended, which will reduce the size of the required septic field by 85%.
- The site will be accessed by a T-Intersection connecting the extension of Forest Ridge Road and new proposed road within a 20.0 m ROW going from South-West to North-East with propose Cul-de-Sac at both ends.
- A proposed 6.0 m wide Emergency Access Road can be introduced at the end of one of the Cul-de-Sac on the North-East side connection to an existing trail, which allows access to Main Street. The new proposed road will be urbanized in accordance with the Town of Erin Design Standards.
- The functional grading design will conform with the Town of Erin's grading criteria, allowing positive drainage, matching the existing boundary grading conditions and limiting grading within the dripline setbacks.
- The proposed stormwater management approach has been designed to mimic pre-development conditions.
- Stormwater quantity and quality objectives can be achieved for the site through the use of combination of attenuation across previous surfaces and LIDs.
- The Erosion and Sediment Control Plan for the site will be designed and completed as part of the detail design in conformance with the Town of Erin, CVC, Wellington County and the OPSD. Erosion and sediment control will be implemented for all construction activities including topsoil stripping, foundation excavation, construction truck movement and stockpiling of material.

9.0 References

"Stormwater Management Planning and Design Manual", prepared by Ministry of the Environment, 2003

"Municipal Servicing Standards", prepared by Town of Erin, 2007

"Hydrogeological Assessment Report", prepared by R.J. Burnside, 2018

"Environmental Assessment Report', prepared by Savanta, 2018/2019

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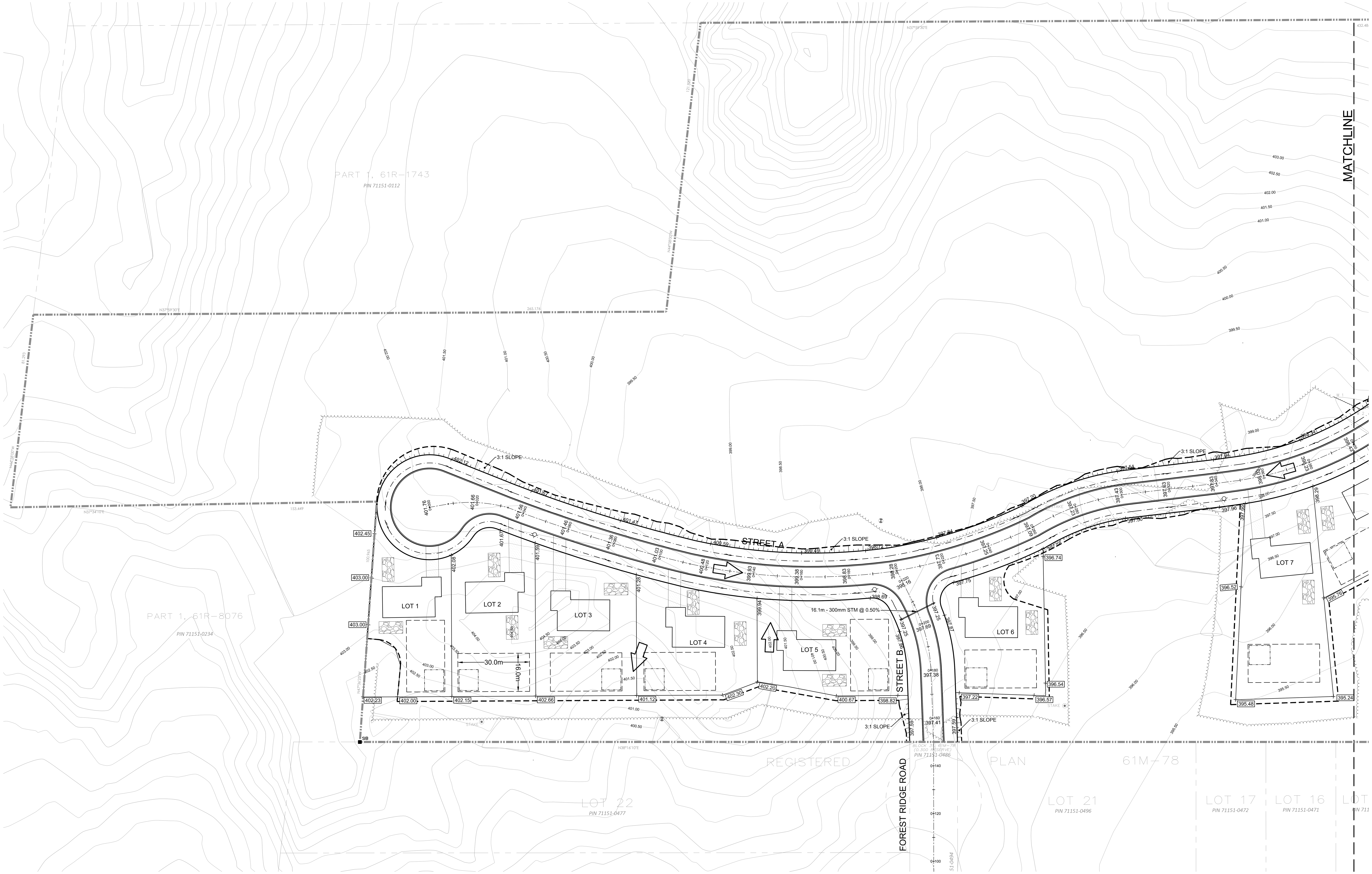
Drawings



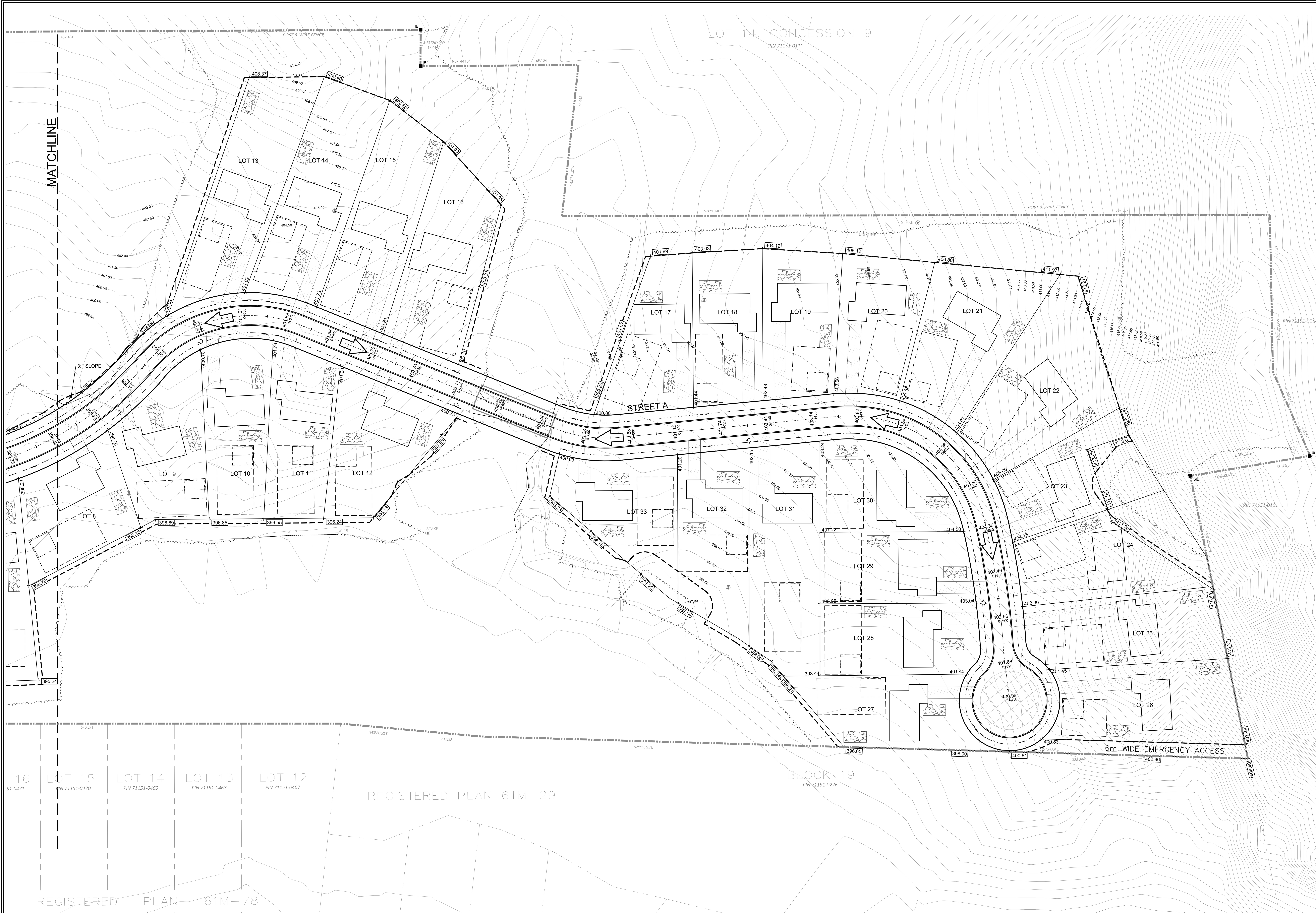
LEGEND

- PROPERTY BOUNDARY
- PROPOSED FIRE HYDRANT
- × 402.00 FINISHED GROUND
- 402.00 MATCH EXISTING GROUND
- OVERLAND FLOW DIRECTION
- PROPOSED SWALE/DITCH
- EXISTING GROUND CONTOUR
- DRIP LINE
- WETLAND
- LIMITS OF GRADING
- INFILTRATION TRENCH
- DENOTES BUFFER EASEMENT
- STANDARD SEPTIC FOOTPRINT
- ADVANCED SEPTIC FOOTPRINT

0 50 100 200 300 400
Metres

BURNSIDE

Figure Title	**ERIN EIGHTH LINE** GRADING PLAN
Client	**HOMES IN THE HILLS, INC. ERIN, ONTARIO**
Drawn	E.L.
Checked	S.R.
Date	2018/12/06
Scale	1:750
Project No.	3000039324
Figure No.	GRD1



LEGEND

- PROPERTY BOUNDARY
- PROPOSED FIRE HYDRANT
- 402.00 FINISHED GROUND
- 402.00 MATCH EXISTING GROUND
- OVERLAND FLOW DIRECTION
- PROPOSED SWALE/DITCH
- EXISTING GROUND CONTOUR
- DRIP LINE
- WETLAND
- LIMITS OF GRADING
- INFILTRATION TRENCH
- DENOTES BUFFER EASEMENT
- STANDARD SEPTIC FOOTPRINT
- ADVANCED SEPTIC FOOTPRINT
- PROPOSED LID

0 10 20 40 60
Metres

BURNSIDE

Client	Figure Title			
HOMES IN THE HILLS, INC. ERIN, ONTARIO	ERIN EIGHTH LINE GRADING PLAN			
	Drawn: E.L.	Checked: S.R.	Date: 2018/12/06	Figure No.: GRD2
	Scale: 1:750		Project No.: 3000039324	

LEGEND

- PROPERTY BOUNDARY
- PROPOSED FILL
- PROPOSED CUT

0 25 50 75 100
Metres

BURNSIDE

Figure Title	ERIN EIGHTH LINE PLAN AND PROFILE
Client	HOMES IN THE HILLS, INC. ERIN, ONTARIO
Drawn	E.L.
Checked	S.R.
Date	2018/12/06
Scale	1:1250 H 1:250 V
Project No.	3000039324
Figure No.	ROW1

BURNSIDE

Figure Title

ERIN EIGHTH LINE

WASTEWATER PLAN

Client

HOMES IN THE HILLS, INC.
ERIN, ONTARIO

Drawn	Checked	Date	Figure No.
E.L.	S.R.	2018/12/06	SAN1
Scale		Project No.	
1:1250		3000039324	

LEGEND

- PROPERTY BOUNDARY
- WETLANDS
- DRIP LINE
- DENOTES BUFFER EASEMENT

0 25 50 75 100
Metres

BURNSIDE

Figure Title	**Erin Eighth Line** CONCEPTUAL SITE PLAN
Client	**HOMES IN THE HILLS, INC. ERIN, ONTARIO**
Drawn	E.L.
Checked	S.R.
Date	2018/12/06
Scale	1:1250
Project No.	300039324
Figure No.	SIT1

LEGEND

PROPERTY BOUNDARY

PROPOSED WATERMAIN

PROPOSED HYDRANT AND VALVE

PROPOSED WATER VALVE

PROPOSED WATER SERVICE

0 25 50 75 100

Metres

BURNSIDE

Figure Title		
ERIN EIGHTH LINE		
WATER DISTRIBUTION PLAN		

Client	Drawn	Checked	Date	Figure No.
HOMES IN THE HILLS, INC. ERIN, ONTARIO	E.L.	S.R.	2018/12/06	WAT1
	Scale 1:1250		Project No. 3000039324	

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Appendix A

Concept Plan by Cox Planning

BENCHMARK:

ELEVATIONS ARE BASED ON GPS OBSERVATIONS TO PERMANENT REFERENCE STATIONS AND HAVE BEEN CORRECTED TO ORTHOMETRIC ELEVATIONS WITH GEOID MODEL HTv2.0, AS SUPPLIED BY NATURAL RESOURCES CANADA.

REFERENCE:

BEARINGS ARE GRID AND RELATE TO PARCEL MAPPING CREATED IN NAD 83 UTM COORDINATES.

LEGEND:

DRIPLINE LIMIT	D 3
WETLAND LIMIT	W 5
EXISTING MONITOR WELL	MW (BY NAYLOR ENG.)
PROPOSED MONITOR WELL	STAKE

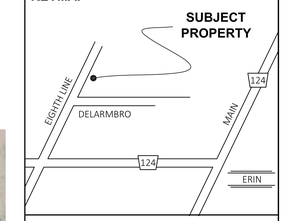
NOTE:

BOUNDARY INFORMATION WAS COMPILED FROM REGISTRY OFFICE INFORMATION.
INFORMATION SHOWN ON THS PLAN WAS OBTAINED ON THE 14th DAY OF NOVEMBER, 2016
SURVEY INFORMATION PROVIDED BY: VAN HARTEN SURVEYING INC.

METRIC:

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND
CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

KEYMAP



CONCEPT PLAN
OF PART OF LOT 14
CONCESSION 9
GEOGRAPHIC TOWNSHIP OF ERIN
TOWN OF ERIN
COUNTY OF WELLINGTON

SCALE 1 : 1500

0 5 10 20 30 40 50 100 metres

REF.	DATE	DESCRIPTION	CH'D
1	.	.	.

REVISIONS

J.L. Cox Planning Consultants Inc.
Urban And Rural Planning Services
17 Spencer Crescent
Guelph, Ontario
N1L 1N1
Tel. (519) 836-5622

.
5431 EIGHT LINE
ERIN, ONTARIO

CONCEPT PLAN

DRAWN: M.J.	CHECKED:
DATE: Oct. 15, 2018	
SCALE: 1:1500	JOB NO.: XX-XXXX
ISSUED:	SHEET NO.: A1

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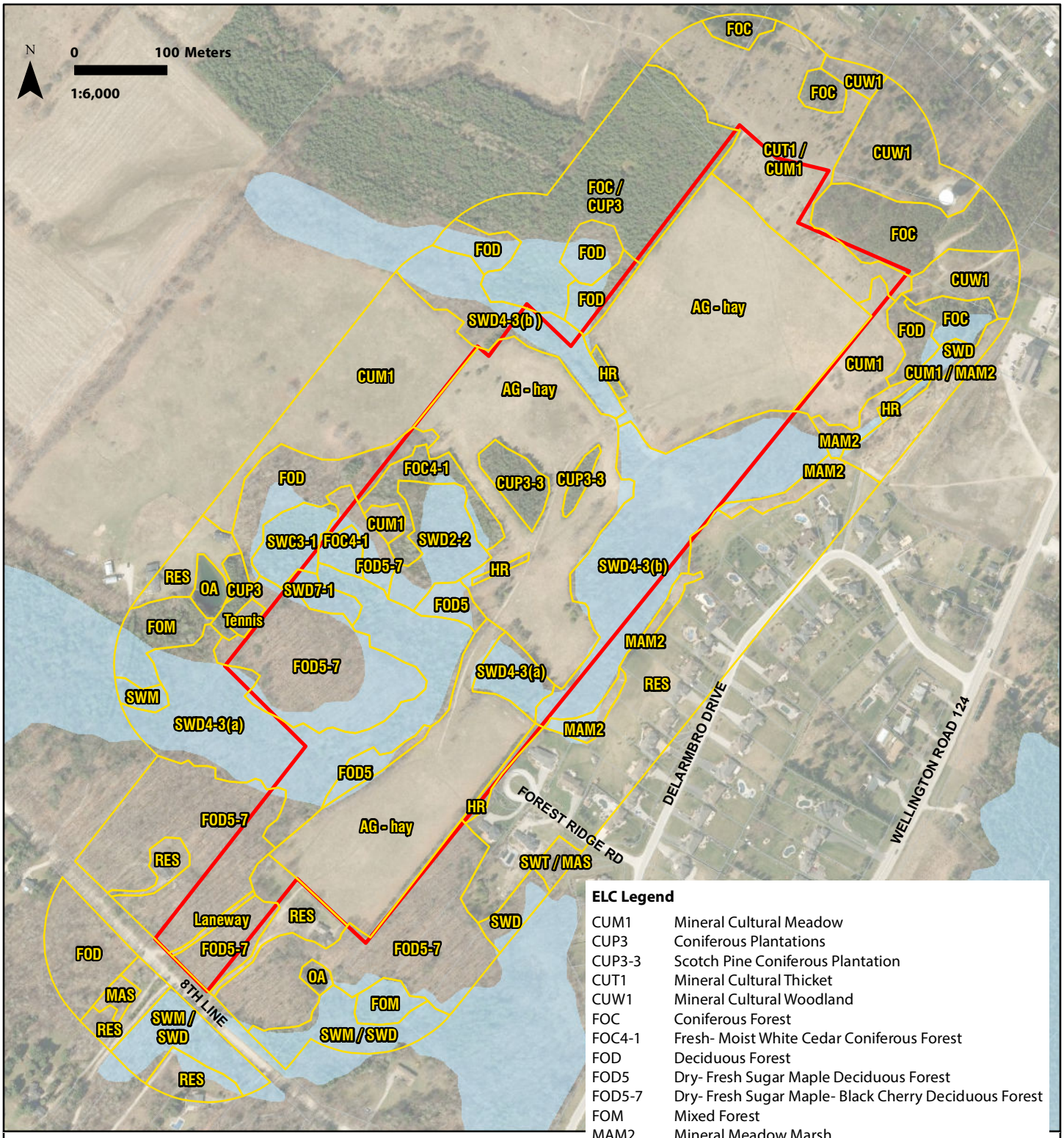
Appendix B

Ecological Land Classification and Natural Heritage by Savanta



ELC Legend

CUM1	Mineral Cultural Meadow
CUP3	Coniferous Plantations
CUP3-3	Scotch Pine Coniferous Plantation
CUT1	Mineral Cultural Thicket
CUW1	Mineral Cultural Woodland
FOC	Coniferous Forest
FOC4-1	Fresh- Moist White Cedar Coniferous Forest
FOD	Deciduous Forest
FOD5	Dry- Fresh Sugar Maple Deciduous Forest
FOD5-7	Dry- Fresh Sugar Maple- Black Cherry Deciduous Forest
FOM	Mixed Forest
MAM2	Mineral Meadow Marsh
MAS	Shallow Marsh
SWC3-1	White Cedar Organic Coniferous Swamp
SWD	Deciduous Swamp
SWD2-2	Green Ash Mineral Deciduous Swamp
SWD4-3(a)	White Birch Poplar Mineral Deciduous Swamp
SWD4-3(b)	White Birch Poplar Mineral Deciduous Swamp
SWD7-1	White Birch- Poplar Organic Deciduous Swamp
SWM	Mixed Swamp
SWT	Thicket Swamp

AG	Agricultural	OA	Open Aquatic
HR	Hedgerow	RES	Residential
Laneway	Laneway	Tennis	Tennis

5431 8th Line Erin

Figure _ Ecological Land Classification

Sujbject Lands

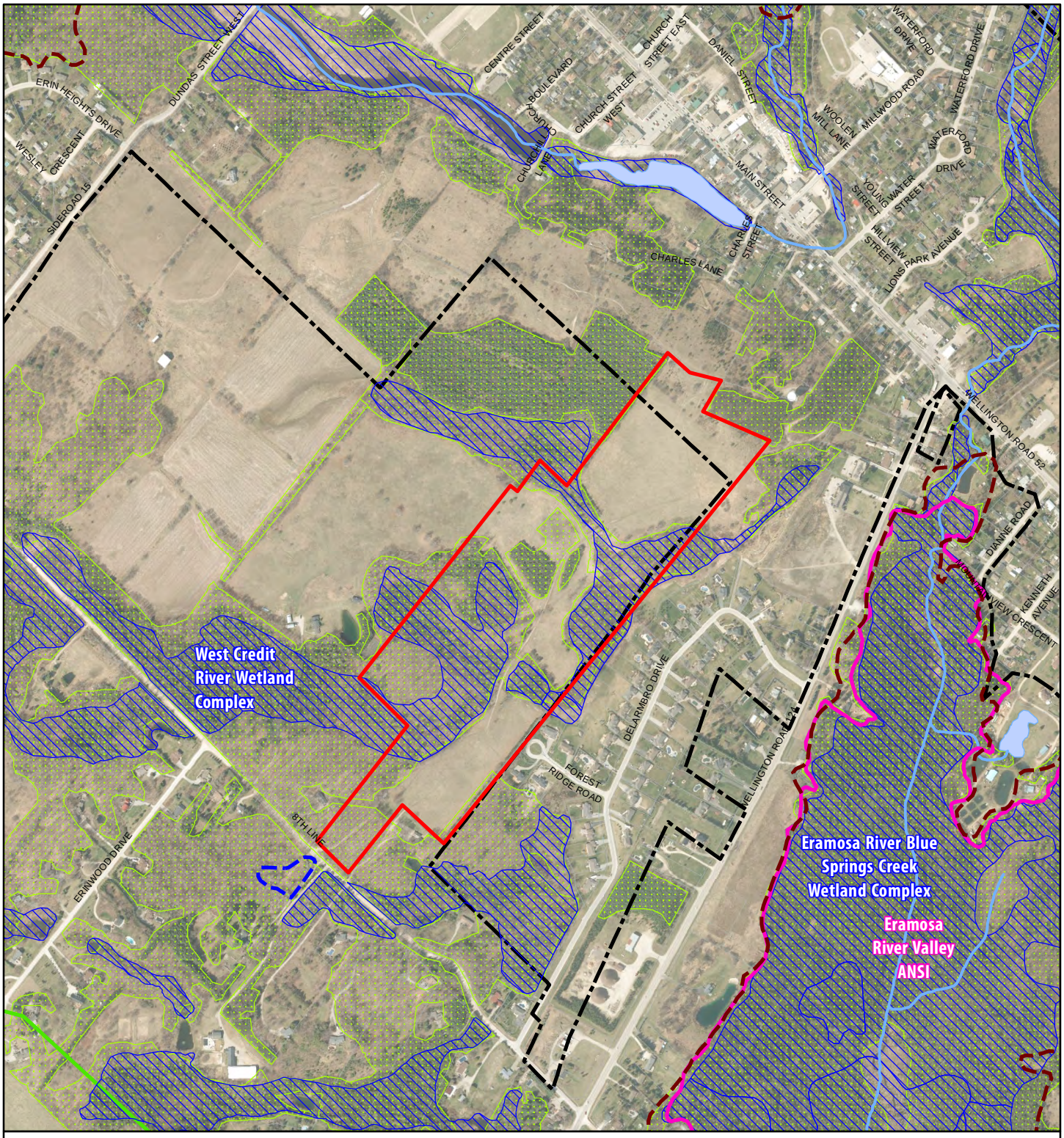
Ecological Land Classification

Provincially Significant Wetland (MNRF LIO)

SAVANTA

Air Photo: MNRF spring 2010.

Path: S:\8945 - SAV 7804 5431 8th Line Erin\gis\mxd\2016 05 25 report figures\Figure _ Ecological Land Classification.mxd REVISED: 2016-10-11 2:22:27 PM



5431 8th Line Erin

Figure 2 Natural Heritage Features

0 0.5 KM

1:10,000

N

- Sujbject Lands
- ANSI (MNRF LIO)
- Watercourse (MNR LIO)
- Waterbody (MNRF LIO)
- Wetland Evaluated-Provincial (MNRF LIO)
- Wetland not evaluated per OWES (MNRF LIO)
- Woodland (MNRF LIO)
- Deer Wintering Area (MNRF LIO)
- Greenbelt Protected Countryside
- Greenbelt Towns and Villages

SAVANTA

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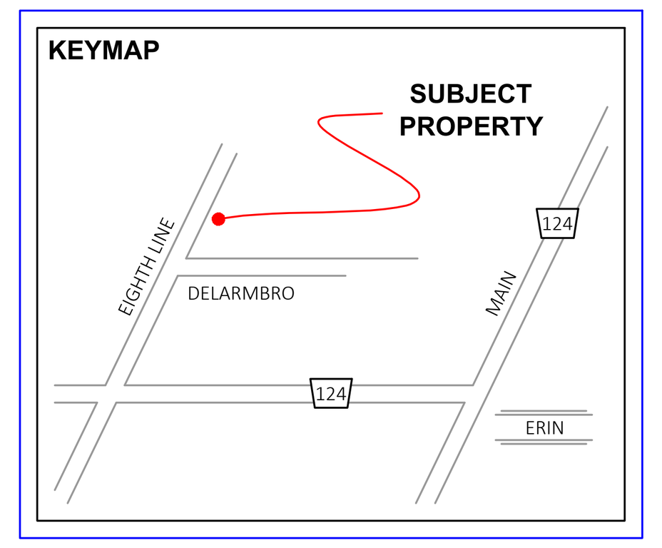
Appendix C

Wetland Setback Survey Drawing by Savanta



TOPOGRAPHIC SURVEY
OF PART OF LOT 14
CONCESSION 9
GEOGRAPHIC TOWNSHIP OF ERIN
TOWN OF ERIN
COUNTY OF WELLINGTON

SCALE 1 : 750

0 5 10 20 30 40 50 metres

VAN HARTEN SURVEYING INC.

BENCHMARK:

ELEVATIONS ARE BASED ON GPS OBSERVATIONS TO PERMANENT REFERENCE STATIONS AND HAVE BEEN CORRECTED TO ORTHOMETRIC ELEVATIONS WITH GEOID MODEL HTv2.0, AS SUPPLIED BY NATURAL RESOURCES CANADA.

REFERENCE:

BEARINGS ARE GRID AND RELATE TO PARCEL MAPPING CREATED IN NAD 83 UTM COORDINATES.

LEGEND:

DRIPLINE LIMIT	D 3
WETLAND LIMIT	W 5
EXISTING MONITOR WELL	MW (BY NAYLOR ENG.)
PROPOSED MONITOR WELL	STAKE

NOTE:

BOUNDARY INFORMATION WAS COMPILED FROM REGISTRY OFFICE INFORMATION.
INFORMATION SHOWN ON THS PLAN WAS OBTAINED ON THE 14th DAY OF NOVEMBER, 2016

ASSOCIATION OF ONTARIO LAND SURVEYORS
VAN HARTEN

METRIC:

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

REVISION SCHEDULE

No.	DATE	BY	COMMENTS
1	11/16/16	JAM	INITIAL SUBMISSION

Van Harten SURVEYING INC.
LAND SURVEYORS and ENGINEERS

Elmira	Guelph	Orangeville
Ph: 519-669-5070	Ph: 519-821-2763	Ph: 519-940-4110

www.vanharten.com info@vanharten.com

DRAWN BY: JAM | CHECKED BY: JML | PROJECT No. 24266-16

Feb 16,2017-2:29pm
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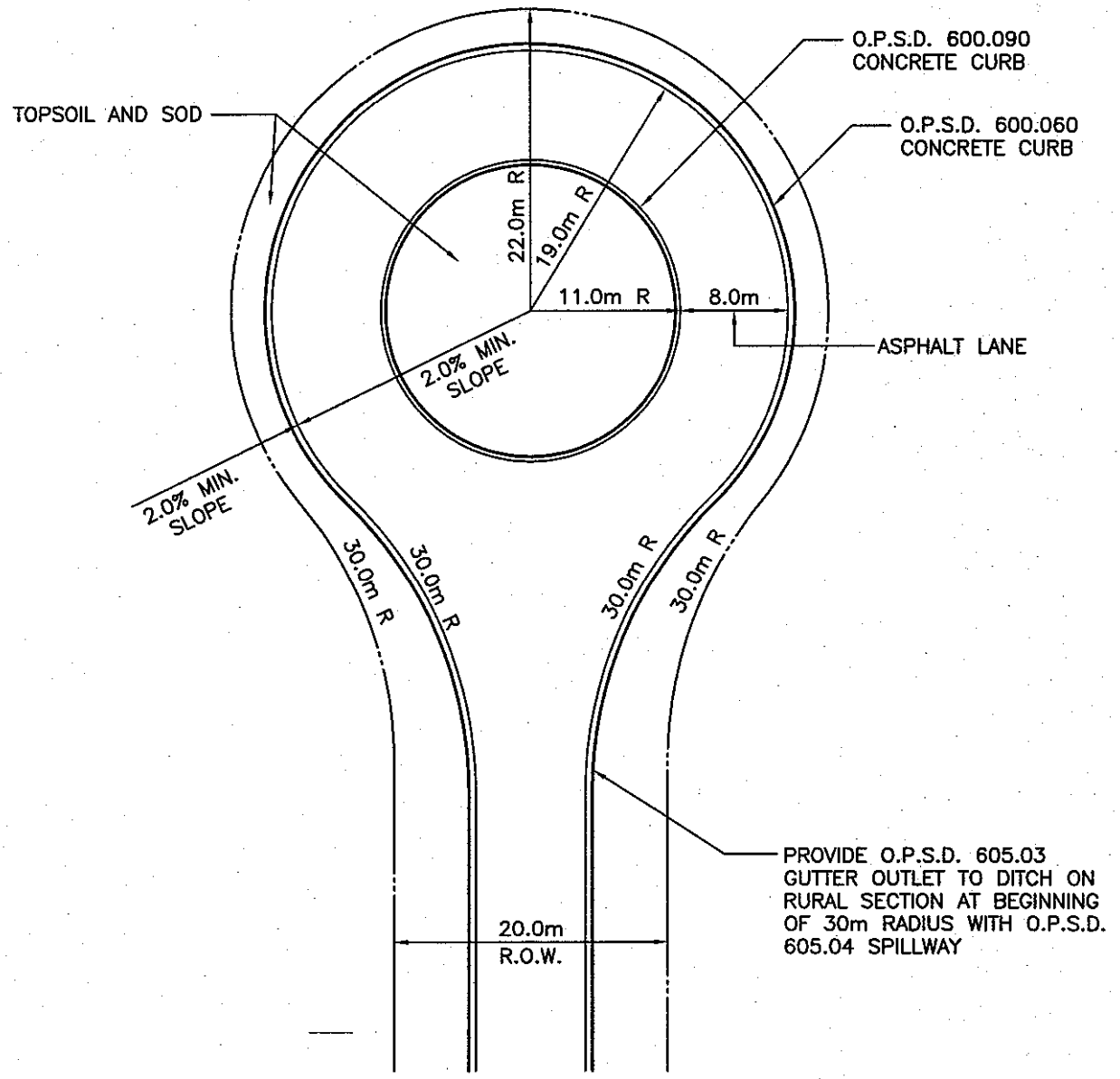
Appendix D

Municipal Standard Drawing D.2 for Cul-De-Sac



TOWN OF ERIN

CUL–DE–SAC STANDARD

D.2

REVISED: NOV/05

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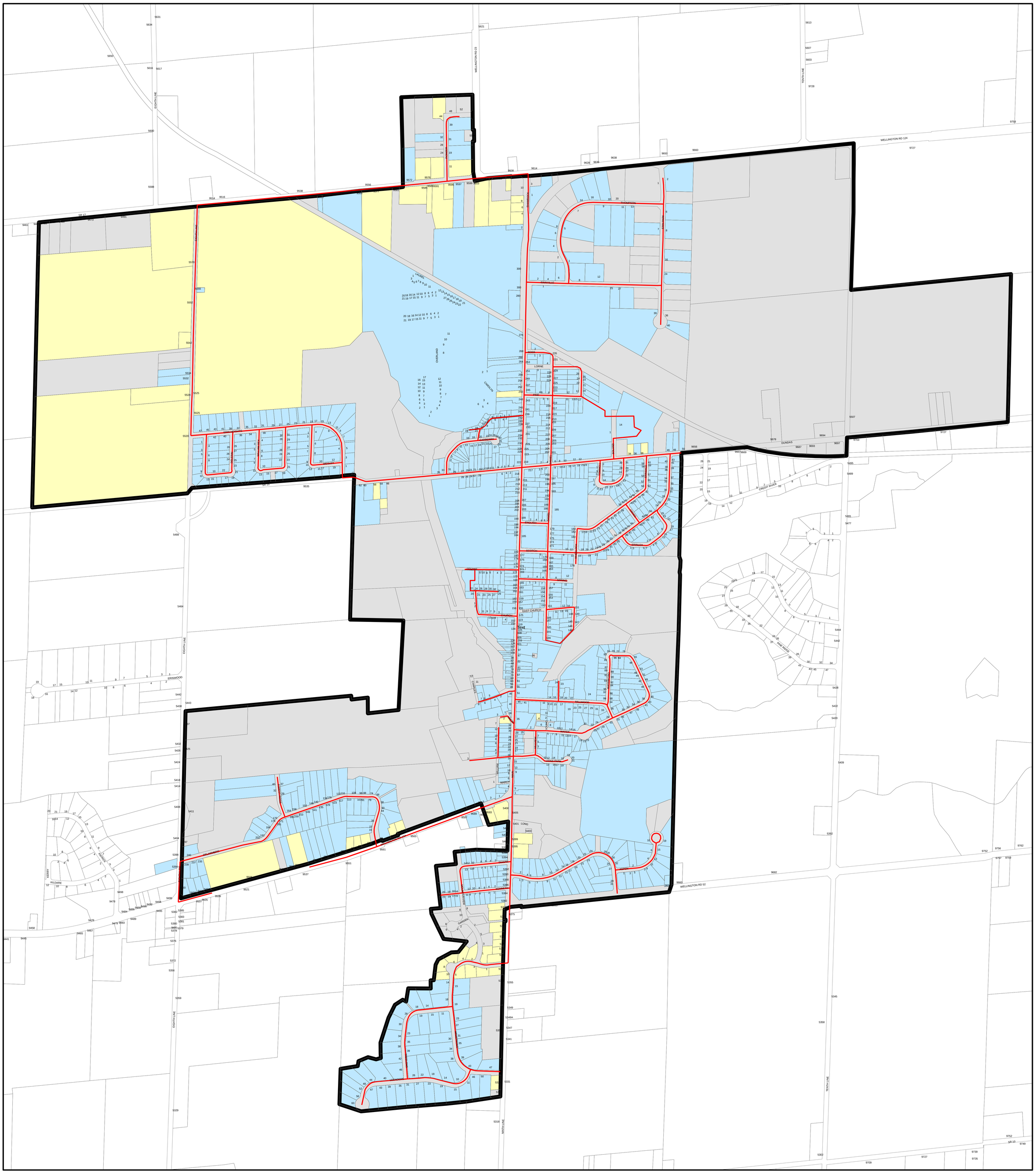
Appendix E

Village of Erin Water Distribution Plan

Village of Erin



0 250 500 1,000 1,500 2,000

Meters

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May not be reproduced without permission.

Sources:
County of Wellington Planning and Development Department 2011.

Legend

- Erin_Water_Main
- 56 Buildings within Urban Boundary not serviced by municipal water
- On Municipal Water
- Urban Boundary

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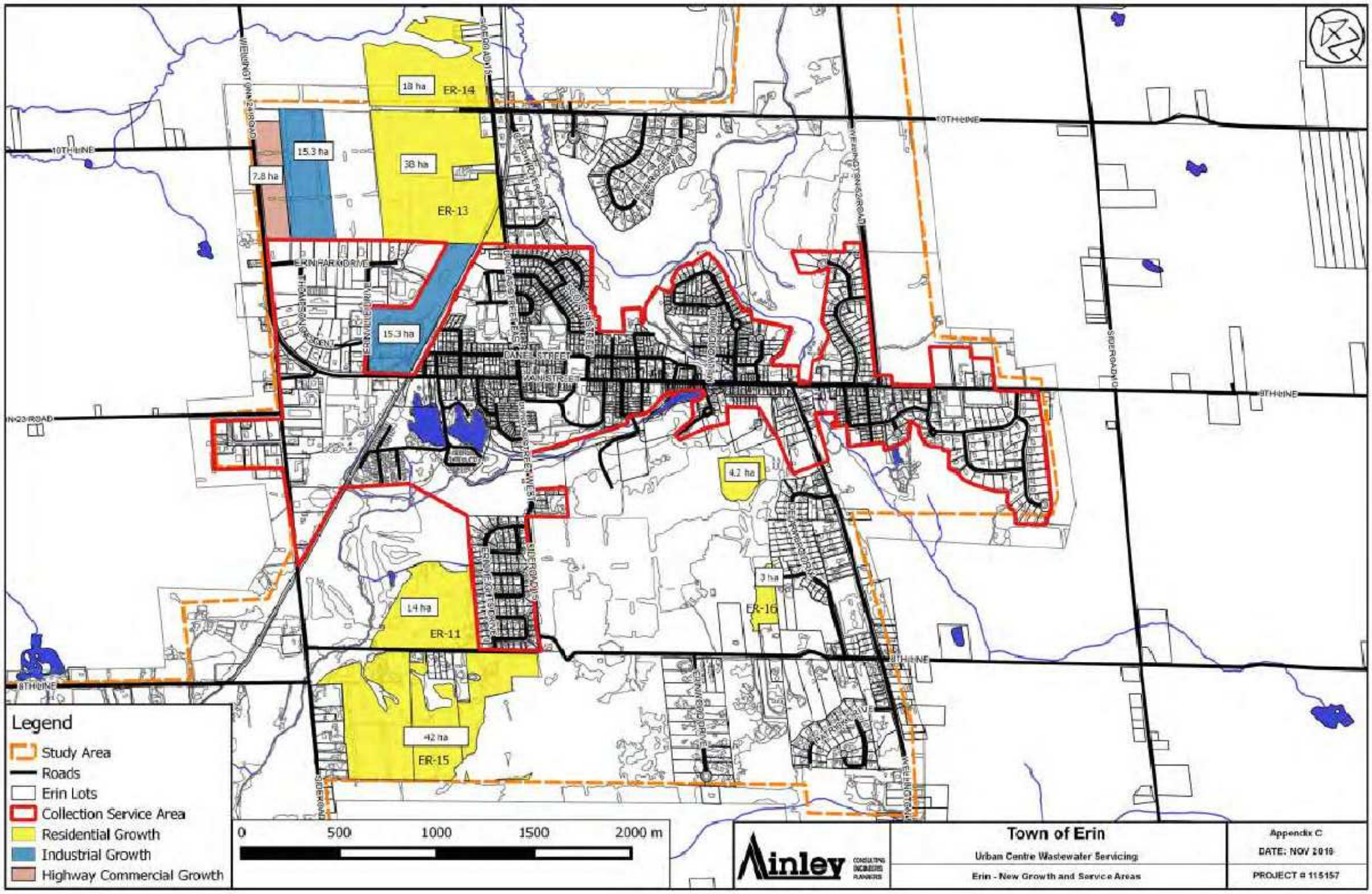
Appendix F

Recommended Urban Centre Wastewater Servicing Plan – Town of Erin


18 ha
ER-14
15.3 ha
7.8 ha
38 ha
ER-13
15.3 ha
4.2 ha
3 ha
ER-16
14 ha
ER-11
42 ha
ER-15
10TH LINE
8TH LINE
SIDE ROAD 10
SIDE ROAD 20
SIDE ROAD 5
WELLINGTON 24 ROAD
WELLINGTON 23 ROAD
WELLINGTON 22 ROAD
MAIN STREET
DUNDAS STREET
ERIN PARK DRIVE
Legend
Study Area
Roads
Erin Lots
Collection Service Area
Residential Growth
Industrial Growth
Highway Commercial Growth
0
500
1000
1500
2000 m
Mainley
CONSULTING ENGINEERS PLANNERS
Town of Erin
Urban Centre Wastewater Servicing
Erin - New Growth and Service Areas
Appendix C
DATE: NOV 2019
PROJECT # 115157

BURNSIDE

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Appendix G

Borehole Logs

LOG OF DRILLING OPERATIONS

MW1-17

BURNSIDE

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Guelph, Ontario N1H 1C4
telephone (519) 823-4995 fax (519) 836-5477

Client: **Homes in the Hills**	Project Name: **8th Line Erin**	Logged by: **D. Beckmann**
Project No.: **300039324**	Location: **Erin, ON**	Ground (m amsl): **401.44**
Drilling Co.: **Lantech Drilling Services Inc.**	Date Started: **2/8/2017**	Static Water Level Depth (m):
Drilling Method: **Hollow Stem Auger**	Date Completed: **2/8/2017**	Sand Pack Depth (m) : **10.05 - 12.19**

Depth Scale (ft)	Depth Scale (m)	Stratigraphic Description (Surface Elevation (m): 401.44)	Strat. Plot	Depth (m)		SAMPLE Num.	Type	Int.	N.Val.
		Topsoil		0.20		SS1	SS		11
	1.0	Reddish brown fine sand, wet.				SS2	SS		42
5.0	2.0					SS3	SS		63
						SS4	SS		64
10.0	3.0	Grey-brown silt, massive, wet, non-cohesive, non-plastic.		2.74		SS5	SS		76
	4.0								
15.0	5.0				bentonite seal	SS6	SS		96
20.0	6.0					SS7	SS		101
	7.0	Grey silt, moist, stiff, low plasticity, cohesive; with small gravel - angular & sub-angular.		6.45					
25.0	8.0					SS8	SS		95
	9.0								
30.0	10.0	Split spoon sampler bounced - sample taken off drill tip - coarse sand & gravel, wet.		9.14		SS9	SS		
35.0	11.0				silica sand pack	SS10	SS		
	12.0	Limestone		12.19	12.19	SS11	SS		
				12.50					

Depth Scale (ft) (m) — Depth Scale (ft) (m)

Prepared By: **Dan Beckmann** Checked By: **Dwight Smikle** Date Prepared: **2/21/2017**

This borehole log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by R. J. Burnside & Associates Limited personnel before use by others.

LEGEND
- Water found @ time of drilling
- Static Water Level -

MONITORING WELL DATA
- Pipe: **51 mm dia. PVC**
- Screen: **51 mm dia. PVC #10 slot**

SAMPLE TYPE
- AC Auger Cutting
- CS Continuous
- RC Rock Core
- SS Split Spoon
- AR Air Rotary
- WC Wash Cuttings

LOG OF DRILLING OPERATIONS

MW2-17

BURNSIDE

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Guelph, Ontario N1H 1C4
telephone (519) 823-4995 fax (519) 836-5477

Client: **Homes in the Hills**	Project Name: **8th Line Erin**	Logged by: **D. Beckmann**
Project No.: **300039324**	Location: **Erin, ON**	Ground (m amsl): **396.31**
Drilling Co.: **Lantech Drilling Services Inc.**	Date Started: **2/8/2017**	Static Water Level Depth (m):
Drilling Method: **Hollow Stem Auger**	Date Completed: **2/9/2017**	Sand Pack Depth (m) : **2.44 - 4.57**

Depth Scale (ft)	Depth Scale (m)	Stratigraphic Description (Surface Elevation (m): 396.31)	Strat. Plot	Depth (m)		SAMPLE Num.	Type	Int.	N.Val.
		Topsoil, moist				SS1	SS		9
		Brown, fine sand, moist. Black mottles with some coarse sand.		0.61					
5.0	1.0				bentonite seal	SS2	SS		7
		Grey-brown silt, wet, with small gravel. Cohesive, non-plastic.		1.83		SS3	SS		32
	2.0								
		Brown, fine sand, wet, with some small gravel. ***Drill kicked on a rock. Took ~30 minutes to move rig to compensate.		2.64		SS4	SS		52
10.0	3.0			2.90					
		Grey-brown silty clay, moist, cohesive, med-high plasticity; with small & large gravel (angular, subangular, rounded).			silica sand pack	SS5	SS		66
	4.0			4.57	4.57	SS6	SS		89

Prepared By: **Dan Beckmann** Checked By: **Dwight Smikle** Date Prepared: **2/21/2017**

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LEGEND
▼ Water found @ time of drilling
▽ Static Water Level -

MONITORING WELL DATA
Pipe: **51 mm dia. PVC**
Screen: **51 mm dia. PVC #10 slot**

SAMPLE TYPE AC Auger Cutting; SS Split Spoon; CS Continuous; AR Air Rotary; RC Rock Core; WC Wash Cuttings

LOG OF DRILLING OPERATIONS

MW3-17

BURNSIDE

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Guelph, Ontario N1H 1C4
telephone (519) 823-4995 fax (519) 836-5477

Client: **Homes in the Hills**	Project Name: **8th Line Erin**	Logged by: **D. Beckmann**
Project No.: **300039324**	Location: **Erin, ON**	Ground (m amsl): **395.5**
Drilling Co.: **Lantech Drilling Services Inc.**	Date Started: **2/9/2017**	Static Water Level Depth (m):
Drilling Method: **Hollow Stem Auger**	Date Completed: **2/9/2017**	Sand Pack Depth (m) : **3.2 - 5.33**

Depth Scale (ft)	Depth Scale (m)	Stratigraphic Description (Surface Elevation (m): 395.50)	Strat. Plot	Depth (m)		SAMPLE Num.	Type	Int.	N.Val.
		Saturated peat.				SS1	AU		11
	1.0					SS2	SS		12
5.0		Grey-brown sandy silt, wet, on-cohesive. With small & large gravel - angular & subangular.		1.52	bentonite seal	SS3	SS		66
	2.0	Rough drilling until 1.83m (6'). Grey-brown med sand, wet.		1.83					
		Coarse sand & gravel, wet.		2.44		SS4	SS		83
10.0	3.0					SS5	SS		53
	4.0								
15.0		Brown, med sand, wet.		4.57	silica sand pack	SS6	SS		127
	5.0	Coarse sand & gravel, wet.		4.88					
		Limestone bedrock.		5.33	5.33				
				5.50					

Prepared By: **Dan Beckmann** Checked By: **Dwight Smikle** Date Prepared: **2/21/2017**

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LEGEND
▼ Water found @ time of drilling
▽ Static Water Level -

MONITORING WELL DATA
Pipe: **51 mm dia. PVC**
Screen: **51 mm dia. PVC #10 slot**

SAMPLE TYPE AC Auger Cutting; SS Split Spoon; CS Continuous; AR Air Rotary; RC Rock Core; WC Wash Cuttings

LOG OF DRILLING OPERATIONS

MW4-17

BURNSIDE

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Guelph, Ontario N1H 1C4
telephone (519) 823-4995 fax (519) 836-5477

Client: **Homes in the Hills**	Project Name: **8th Line Erin**	Logged by: **D. Beckmann**
Project No.: **300039324**	Location: **Erin, ON**	Ground (m amsl): **404.1**
Drilling Co.: **Lantech Drilling Services Inc.**	Date Started: **2/9/2017**	Static Water Level Depth (m):
Drilling Method: **Hollow Stem Auger**	Date Completed: **2/9/2017**	Sand Pack Depth (m) : **3.96 - 6.1**

Depth Scale (ft)	Depth Scale (m)	Stratigraphic Description (Surface Elevation (m): 404.10)	Strat. Plot	Depth (m)		SAMPLE Num.	Type	Int.	N.Val.	Depth Scale (ft)	Depth Scale (m)
		Topsoil, moist.									
		Brown, sandy silt, non-cohesive, thinly bedded, wet. With some small gravel.		0.30		SS1	SS		14		
5.0	1.0					SS2	SS		31	5.0	1.0
		Reddish brown, clayey silt, wet, cohesive, non-plastic. Some small gravel.		1.52	bentonite seal	SS3	SS		14		
		Grey-brown clayey silt, wet, massive, cohesive, low plasticity. With some small gravel - subangular. At 5.18m (17') drill rig was shakey presumably due to rocks down to 6.1m (20').		2.29		SS4	SS		13		
10.0	3.0					SS5	SS		30	10.0	3.0
	4.0										4.0
15.0	5.0					SS6	SS		64	15.0	5.0
					silica sand pack						
20.0	6.0			6.10	6.10					20.0	6.0

Prepared By: **Dan Beckmann** Checked By: **Dwight Smikle** Date Prepared: **2/21/2017**

This borehole log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by R. J. Burnside & Associates Limited personnel before use by others.

LEGEND
▼ Water found @ time of drilling
▽ Static Water Level -

MONITORING WELL DATA
Pipe: **51 mm dia. PVC**
Screen: **51 mm dia. PVC #10 slot**

SAMPLE TYPE AC Auger Cutting; SS Split Spoon; CS Continuous; AR Air Rotary; RC Rock Core; WC Wash Cuttings

LOG OF DRILLING OPERATIONS

MW5-17

BURNSIDE

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Guelph, Ontario N1H 1C4
telephone (519) 823-4995 fax (519) 836-5477

Client: **Homes in the Hills**	Project Name: **8th Line Erin**	Logged by: **D. Beckmann**
Project No.: **300039324**	Location: **Erin, ON**	Ground (m amsl): **405.96**
Drilling Co.: **Lantech Drilling Services Inc.**	Date Started: **2/9/2017**	Static Water Level Depth (m):
Drilling Method: **Hollow Stem Auger**	Date Completed: **2/9/2017**	Sand Pack Depth (m) : **2.13 - 4.57**

Depth Scale (ft)	Depth Scale (m)	Stratigraphic Description (Surface Elevation (m): 405.96)	Strat. Plot	Depth (m)		SAMPLE Num.	Type	Int.	N.Val.
		Topsoil, moist.				SS1	SS		7
	1.0	Reddish brown fine sand, moist, loose.		0.76	bentonite seal	SS2	SS		12
5.0	2.0					SS3	SS		10
		Grey brown sandy silt, wet, non-cohesive, non-plastic. With small & large gravel - angular & subangular.		2.29		SS4	SS		47
10.0	3.0			3.81	silica sand pack 3.81	SS5	SS		31

Prepared By: **Dan Beckmann** Checked By: **Dwight Smikle** Date Prepared: **2/21/2017**

This borehole log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by R. J. Burnside & Associates Limited personnel before use by others.

LEGEND
▼ Water found @ time of drilling
▽ Static Water Level -

MONITORING WELL DATA
Pipe: **51 mm dia. PVC**
Screen: **51 mm dia. PVC #10 slot**

SAMPLE TYPE AC Auger Cutting; SS Split Spoon; CS Continuous; AR Air Rotary; RC Rock Core; WC Wash Cuttings

BHLOG GUELPH P:\GINT\PROJECTS\300 JOBS\300039324\LANTECH MWS FEB 2017.GPJ TEMPLATE.GDT 6/12/17

LOG OF DRILLING OPERATIONS

MW6A-17

BURNSIDE

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Guelph, Ontario N1H 1C4
telephone (519) 823-4995 fax (519) 836-5477

Client: **Homes in the Hills**	Project Name: **8th Line Erin**	Logged by: **D. Beckmann**
Project No.: **300039324**	Location: **Erin, ON**	Ground (m amsl): **399.60**
Drilling Co.: **Lantech Drilling Services Inc.**	Date Started: **2/10/2017**	Static Water Level Depth (m):
Drilling Method: **Hollow Stem Auger**	Date Completed: **2/10/2017**	Sand Pack Depth (m) : **11.27 - 13.56**

Depth Scale (ft)	Depth Scale (m)	Stratigraphic Description (Surface Elevation (m): 399.60)	Strat. Plot	Depth (m)		SAMPLE Num.	Type	Int.	N.Val.	Depth Scale (ft)	Depth Scale (m)
		Topsoil, moist.				SS1	SS		55		
		Reddish brown fine sand, dry. Wet from 2.29 to 2.74 m.		0.46							
	1.0					SS2	SS		7		1.0
5.0										5.0	
	2.0					SS3	SS		18		2.0
						SS4	SS		54		
		Grey-brown silt, dry, dense.		2.74							
10.0	3.0	Grey-brown sandy silt, wet, non-cohesive, loose. Smooth drilling from 3.05 to 4.57 m.		3.05	bentonite seal	SS5	SS		60	10.0	3.0
	4.0										4.0
15.0						SS6	SS		93	15.0	
	5.0	Brown med sand, wet.		4.88							5.0
	6.0										6.0
20.0		Grey sandy silt, wet, dense, with some small gravel.		6.25		SS7	SS		142	20.0	
		Grey-brown silt, moist, dense, massive. With some small gravel - angular & subangular.		6.40							

Prepared By: **Dan Beckmann** Checked By: **Dwight Smikle** Date Prepared: **2/21/2017**

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LEGEND
▼ Water found @ time of drilling
▽ Static Water Level -

MONITORING WELL DATA
Pipe: **51 mm dia. PVC**
Screen: **51 mm dia. PVC #10 slot**

SAMPLE TYPE AC Auger Cutting; SS Split Spoon; CS Continuous; AR Air Rotary; RC Rock Core; WC Wash Cuttings

LOG OF DRILLING OPERATIONS

MW6A-17

BURNSIDE

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Guelph, Ontario N1H 1C4
telephone (519) 823-4995 fax (519) 836-5477

Client: **Homes in the Hills**	Project Name: **8th Line Erin**	Logged by: **D. Beckmann**
Project No.: **300039324**	Location: **Erin, ON**	Ground (m amsl): **399.60**
Drilling Co.: **Lantech Drilling Services Inc.**	Date Started: **2/10/2017**	Static Water Level Depth (m):
Drilling Method: **Hollow Stem Auger**	Date Completed: **2/10/2017**	Sand Pack Depth (m) : **11.27 - 13.56**

Depth Scale (ft)	Depth Scale (m)	Stratigraphic Description	Strat. Plot	Depth (m)		SAMPLE Num.	Type	Int.	N.Val.
		Surface Elevation (m): **399.60**							
		Drilling got rough at 10.06 m.			bentonite seal				
25.0	8.0					SS8	SS		108
30.0	9.0					SS9	SS		42
	10.0			10.06	grout				
		Coarse sand and gravel retrieved from tip of drill. rough drilling. Drilled down to 13.56m - did not hit bedrock.							
35.0	11.0					SS10	SS		143
	12.0								
40.0	13.0					SS11	AU		
				13.56	silica sand pack				

Prepared By: **Dan Beckmann** Checked By: **Dwight Smikle** Date Prepared: **2/21/2017**

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LEGEND
- Water found @ time of drilling
- Static Water Level -

MONITORING WELL DATA
- Pipe: **51 mm dia. PVC**
- Screen: **51 mm dia. PVC #10 slot**

SAMPLE TYPE
- AC Auger Cutting
- CS Continuous
- RC Rock Core
- SS Split Spoon
- AR Air Rotary
- WC Wash Cuttings

LOG OF DRILLING OPERATIONS

MW6B-17

BURNSIDE

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Guelph, Ontario N1H 1C4
telephone (519) 823-4995 fax (519) 836-5477

Client: **Homes in the Hills**	Project Name: **8th Line Erin**	Logged by: **D. Beckmann**
Project No.: **300039324**	Location: **Erin, ON**	Ground (m amsl): **399.60**
Drilling Co.: **Lantech Drilling Services Inc.**	Date Started: **2/10/2017**	Static Water Level Depth (m):
Drilling Method: **Hollow Stem Auger**	Date Completed: **2/10/2017**	Sand Pack Depth (m) : **3.96 - 6.1**

Depth Scale (ft)	Depth Scale (m)	Stratigraphic Description (Surface Elevation (m): 399.60)	Strat. Plot	Depth (m)	SAMPLE Num.	SAMPLE Type	SAMPLE Int.	Depth Scale (ft)	Depth Scale (m)
		Topsoil, moist.							
		Reddish brown fine sand, dry. Wet from 2.29 to 2.74 m.		0.46					
5.0	1.0							5.0	1.0
	2.0								2.0
		Grey-brown silt, dry, dense.		2.74					
10.0	3.0	Grey-brown sandy silt, wet, non-cohesive, loose. Smooth drilling from 3.05 to 4.57 m.		3.05				10.0	3.0
	4.0								4.0
15.0								15.0	
	5.0	Brown med sand, wet.		4.88					5.0
	6.0			6.10				20.0	6.0

bentonite seal

silica sand pack

6.10

Prepared By: **Dan Beckmann** Checked By: **Dwight Smikle** Date Prepared: **2/21/2017**

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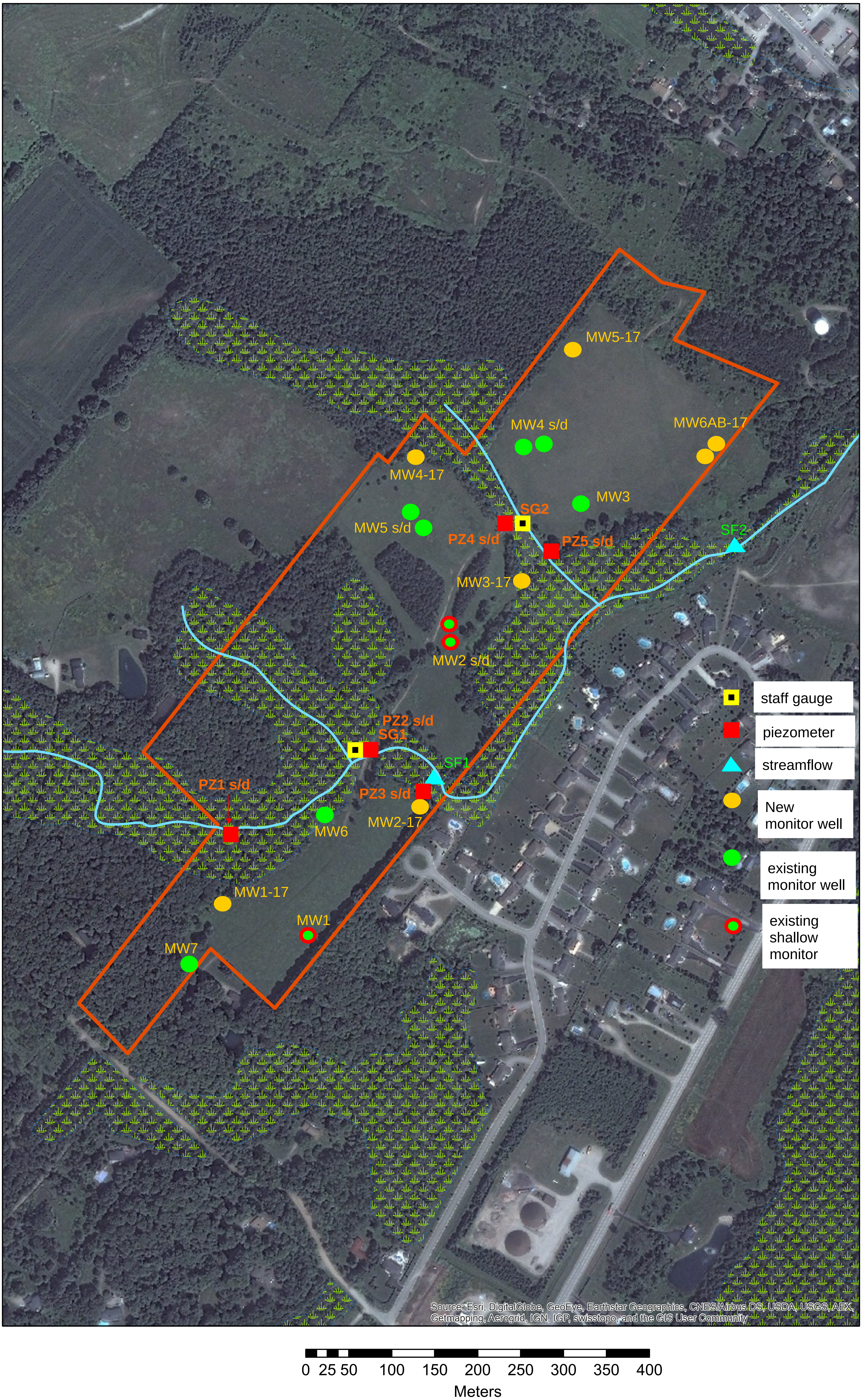
LEGEND
▼ Water found @ time of drilling
▽ Static Water Level -

MONITORING WELL DATA
Pipe: **51 mm dia. PVC**
Screen: **51 mm dia. PVC #10 slot**

SAMPLE TYPE AC Auger Cutting; SS Split Spoon; CS Continuous; AR Air Rotary; RC Rock Core; WC Wash Cuttings


MW5-17
MW4 s/d
MW6AB-17
MW4-17
MW3
SG2
MW5 s/d
PZ4 s/d
PZ5 s/d
SF2
MW3-17
MW2 s/d
PZ2 s/d
SG1
SF1
PZ1 s/d
PZ3 s/d
MW6
MW2-17
MW1-17
MW1
MW7
staff gauge
piezometer
streamflow
New monitor well
existing monitor well
existing shallow monitor
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
0 25 50 100 150 200 250 300 350 400
Meters

BURNSIDE

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Appendix H

Stormwater Management Modelling and Calculations

Project Name: Erin 8th Line
Project No: 300039324
Location: Erin, Ontario
Designer: AF
Date: 29-Nov-2018
Date Modified: 5-Dec-2018

SCS Curve Number, Initial Abstraction, and Time of Concentration Reference Sheet

SCS Curve Number Data (CVC Standards)

Hydrologic Soil Group	SCS Curve Number (AMCII)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Hardscape	Water
A	36	46	66	56	100	100
AB	48	56	70	63.5	100	100
B	60	66	74	71	100	100
BC	66.5	71.5	78	76	100	100
C	73	77	82	81	100	100
CD	76	79.5	84	83	100	100
D	79	82	86	85	100	100

CN (I)= 4.2CN(II)/(10-0.058CN(II)) CN (III)= 23CN(II)/(10+0.13CN(II))

NOTE: Standhyd commands - CN value is based solely on the pervious surfaces only.
Nashyd commands - CN value is based on a composite of both the pervious and impervious surfaces

Initial Rainfall Abstraction Data (CVC Standards)

Initial Rainfall Abstraction, Ia (mm)						
Land Use	Forest/Woodlot	Meadow/Field	Cultivated/Crop	Lawn/Grass	Hardscape	Water
Ia	10	8	4	5	2	0

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: EXT-1

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB	74.93		24.47			
B						
BC						
C						
CD						
D						

Total area (ha):	**99.4**	Composite CN(I):	33	**Ia (mm) NVCA**	**8.5**
Pervious area (ha):	**99.4**	**Composite CN(II):**	**53**		
Impervious area (ha):	**0.0**	Composite CN(III):	73		

Time of Concentration Input Parameters	
Total Area (ha)	99.40
Runoff Coefficient	0.25
Total Imperviousness	0.07
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: EXT-2

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A	16.55		16.55			
AB						
B						
BC						
C						
CD						
D						

Total area (ha):	**33.1**	Composite CN(I):	30	**Ia (mm) NVCA**	**7.0**
Pervious area (ha):	**33.1**	**Composite CN(II):**	**51**		
Impervious area (ha):	**0.0**	Composite CN(III):	71		

Time of Concentration Input Parameters	
Total Area (ha)	33.10
Runoff Coefficient	0.25
Total Imperviousness	0.07
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: EXT-3

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A	0.53					
AB						
B						
BC						
C						
CD						
D						

Total area (ha):	**0.53**	Composite CN(I):	19	**Ia (mm) NVCA**	**10.0**
Pervious area (ha):	**0.53**	**Composite CN(II):**	**36**		
Impervious area (ha):	**0.00**	Composite CN(III):	56		

Time of Concentration Input Parameters	
Total Area (ha)	0.53
Runoff Coefficient	0.25
Total Imperviousness	0.07
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: 101

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB						
B	10.009		3.89			
BC						
C						
CD						
D						

Total area (ha):	13.9	**Composite CN(I):**	43	**Ia (mm) NVCA**	8.3
Pervious area (ha):	13.9	**Composite CN(II):**	64		
Impervious area (ha):	0.0	**Composite CN(III):**	80		

Time of Concentration Input Parameters	
Total Area (ha)	13.90
Runoff Coefficient	0.25
Total Imperviousness	0.07
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: 102

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A	2.591		5.21			
AB						
B						
BC						
C						
CD						
D						

Total area (ha):	**7.8**	Composite CN(I):	35	**Ia (mm) NVCA**	**5.99**
Pervious area (ha):	**7.8**	**Composite CN(II):**	**56**		
Impervious area (ha):	**0.0**	Composite CN(III):	75		

Time of Concentration Input Parameters	
Total Area (ha)	7.80
Runoff Coefficient	0.25
Total Imperviousness	0.07
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: 103

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A	0.1464		2.27			
AB						
B						
BC						
C						
CD						
D						

Total area (ha):	**2.42**	Composite CN(I):	43	**Ia (mm) NVCA**	**4.4**
Pervious area (ha):	**2.42**	**Composite CN(II):**	**64**		
Impervious area (ha):	**0.00**	Composite CN(III):	80		

Time of Concentration Input Parameters	
Total Area (ha)	2.42
Runoff Coefficient	0.25
Total Imperviousness	0.07
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: UNC1

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB						
B	0.40					
BC						
C						
CD						
D						

Total area (ha):	**0.40**	Composite CN(I):	39	**Ia (mm) NVCA**	**10.0**
Pervious area (ha):	**0.40**	**Composite CN(II):**	**60**		
Impervious area (ha):	**0.00**	Composite CN(III):	78		

Time of Concentration Input Parameters	
Total Area (ha)	0.40
Runoff Coefficient	0.25
Total Imperviousness	0.07
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: UNC2 PRE-DEVELOPMENT

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB						
B	0.2904		0.45			
BC						
C						
CD						
D						

Total area (ha):	**0.74**	Composite CN(I):	48	**Ia (mm) NVCA**	**6.4**
Pervious area (ha):	**0.74**	**Composite CN(II):**	**69**		
Impervious area (ha):	**0.00**	Composite CN(III):	83		

Time of Concentration Input Parameters	
Total Area (ha)	0.74
Runoff Coefficient	0.25
Total Imperviousness	0.07
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: UNC3

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB						
B	0.27					
BC						
C						
CD						
D						

Total area (ha):	**0.27**	Composite CN(I):	39	**Ia (mm) NVCA**	**10.0**
Pervious area (ha):	**0.27**	**Composite CN(II):**	**60**		
Impervious area (ha):	**0.00**	Composite CN(III):	78		

Time of Concentration Input Parameters	
Total Area (ha)	0.27
Runoff Coefficient	0.25
Total Imperviousness	0.07
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: UNC4

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Pavement	Water
A						
AB						
B	0.14					
BC						
C						
CD						
D						

Total area (ha):	**0.14**	Composite CN(I):	39	**Ia (mm) NVCA**	**10.0**
Pervious area (ha):	**0.14**	**Composite CN(II):**	**60**		
Impervious area (ha):	**0.0**	Composite CN(III):	78		

Time of Concentration Input Parameters	
Total Area (ha)	0.14
Runoff Coefficient	0.25
Total Imperviousness	0.07
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: UNC2 POST DEVELOPMENT

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Hardscape	Water
A						
AB						
B	0.2904			0.46	0.0492	
BC						
C						
CD						
D						

Total area (ha):	**0.80**	Composite CN(I):	48	**Ia (mm) NVCA**	**6.6**
Pervious area (ha):	**0.75**	**Composite CN(II):**	**69**		
Impervious area (ha):	**0.05**	Composite CN(III):	84		

Time of Concentration Input Parameters	
Total Area (ha)	0.80
Runoff Coefficient	0.29
Total Imperviousness	0.13
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO STANDHYD Hydrologic Modeling Parameters - Urban Land Use

CATCHMENT: 201A

Composite Curve Number

Hydrologic Soil Group	Total Area per Various Land Use (ha)			
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass
A				
AB				1.192
B	2.553			0.397225
BC				
C				
CD				
D				

Total area (ha):	**5.06**	Pervious CN (AMCI):	41
Pervious area (ha):	**4.14**	**Pervious CN (AMCII):**	**62**
Impervious area (ha):	**0.92**	Pervious CN (AMCIII):	79

Impervious % - Directly Connected (XIMP) and Total (TIMP)

Land Use	Area (ha)	XIMP (%)	TIMP (%)
Roadway	0.5476	0	24.0%
Driveway	0.142		
Sidewalk			
Building	0.23		
Other			
		RC	0.37

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: 201B

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Hardscape	Water
A						
AB						
B	0.5716			0.40	0.1111	
BC						
C						
CD						
D						

Total area (ha):	**1.08**	Composite CN(I):	47	**Ia (mm) NVCA**	**7.3**
Pervious area (ha):	**0.97**	**Composite CN(II):**	**68**		
Impervious area (ha):	**0.11**	Composite CN(III):	83		

Time of Concentration Input Parameters	
Total Area (ha)	1.08
Runoff Coefficient	0.32
Total Imperviousness	0.17
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: 201C

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Hardscape	Water
A						
AB						
B	1.0293			0.8849	0.07	
BC						
C						
CD						
D						

Total area (ha):	**1.98**	Composite CN(I):	45	**Ia (mm) NVCA**	**7.5**
Pervious area (ha):	**1.9**	**Composite CN(II):**	**66**		
Impervious area (ha):	**0.1**	Composite CN(III):	82		

Time of Concentration Input Parameters	
Total Area (ha)	1.98
Runoff Coefficient	0.27
Total Imperviousness	0.10
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: 201D

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Hardscape	Water
A						
AB						
B	5.54					
BC						
C						
CD						
D						

Total area (ha):	**5.54**	Composite CN(I):	39	**Ia (mm) NVCA**	**10.0**
Pervious area (ha):	**5.54**	**Composite CN(II):**	**60**		
Impervious area (ha):	**0.00**	Composite CN(III):	78		

Time of Concentration Input Parameters	
Total Area (ha)	5.54
Runoff Coefficient	0.25
Total Imperviousness	0.07
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO STANDHYD Hydrologic Modeling Parameters - Urban Land Use

CATCHMENT: 202A

Composite Curve Number

Hydrologic Soil Group	Total Area per Various Land Use (ha)			
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass
A	0.6373			1.83
AB				
B				
BC				
C				
CD				
D				

Total area (ha):	**3.05**	Pervious CN (AMCI):	30
Pervious area (ha):	**2.47**	**Pervious CN (AMCII):**	**51**
Impervious area (ha):	**0.58**	Pervious CN (AMCIII):	70

Impervious % - Directly Connected (XIMP) and Total (TIMP)

Land Use	Area (ha)	XIMP (%)	TIMP (%)
Roadway	0.259	0	24.9%
Driveway	0.1267		
Sidewalk			
Building	0.1969		
Other			

RC 0.37

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: 202B

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Hardscape	Water
A	1.248			0.27	0.0328	
AB						
B						
BC						
C						
CD						
D						

Total area (ha):	1.55	Composite CN(I):	22	**Ia (mm) NVCA**	**9.0**
Pervious area (ha):	1.52	**Composite CN(II):**	**41**		
Impervious area (ha):	0.03	Composite CN(III):	61		

Time of Concentration Input Parameters	
Total Area (ha)	1.55
Runoff Coefficient	0.26
Total Imperviousness	0.09
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: 202C

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Hardscape	Water
A	0.7607			0.51	0.0656	
AB						
B						
BC						
C						
CD						
D						

Total area (ha):	**1.34**	Composite CN(I):	27	**Ia (mm) NVCA**	**7.7**
Pervious area (ha):	**1.27**	**Composite CN(II):**	**47**		
Impervious area (ha):	**0.07**	Composite CN(III):	67		

Time of Concentration Input Parameters	
Total Area (ha)	1.34
Runoff Coefficient	0.28
Total Imperviousness	0.12
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: 202D

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Hardscape	Water
A	1.308			0.55	0.0984	
AB						
B						
BC						
C						
CD						
D						

Total area (ha):	1.96	Composite CN(I):	25	**Ia (mm) NVCA**	8.2
Pervious area (ha):	1.86	**Composite CN(II):**	**45**		
Impervious area (ha):	0.10	Composite CN(III):	65		

Time of Concentration Input Parameters	
Total Area (ha)	1.96
Runoff Coefficient	0.28
Total Imperviousness	0.12
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO STANDHYD Hydrologic Modeling Parameters - Urban Land Use

CATCHMENT: 203A

Composite Curve Number

Hydrologic Soil Group	Total Area per Various Land Use (ha)			
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass
A	0.1993			1.25
AB				
B				
BC				
C				
CD				
D				

Total area (ha):	**1.96**	Pervious CN (AMCI):	32
Pervious area (ha):	**1.45**	**Pervious CN (AMCII):**	**53**
Impervious area (ha):	**0.51**	Pervious CN (AMCIII):	72

Impervious % - Directly Connected (XIMP) and Total (TIMP)

Land Use	Area (ha)	XIMP (%)	TIMP (%)
Roadway	0.1718	0	31.3%
Driveway	0.1423		
Sidewalk			
Building	0.1968		
Other			

RC 0.42

Project Name:	Erin 8th Line
Project No.:	300039324
Location:	Erin, Ontario
Created By:	AF
Checked By:	J.Scott
Date Created:	29-Nov-2018
Date Modified:	5-Dec-2018

SWMHYMO NASHYD Hydrologic Modeling Parameters - Rural Land Use

CATCHMENT: 203B

Composite Curve Number and Initial Abstraction

Hydrologic Soil Group	Total Area per Various Land Use (ha)					
	Forest/Woodlot	Meadow/Field	Crop	Lawn/Grass	Hardscape	Water
A	0.0869			0.37	0.0656	
AB						
B						
BC						
C						
CD						
D						

Total area (ha):	**0.52**	Composite CN(I):	37	**Ia (mm) NVCA**	**5.5**
Pervious area (ha):	**0.45**	**Composite CN(II):**	**58**		
Impervious area (ha):	**0.07**	Composite CN(III):	76		

Time of Concentration Input Parameters	
Total Area (ha)	0.52
Runoff Coefficient	0.33
Total Imperviousness	0.19
Length (m)	
h_1 (m)	
h_2 (m)	
Dh (m)	
Slope (%)	

Project: **Erin 8th Line**
Project #:
Designed By:
Checked By:
Date: 5-Dec-2018

BURNSIDE

Airport Method for Time to Peak Calculations

Natural Area Watershed Information

WS	Area (ha)	Length (m)	RC	Slope (%)	Time of Concentration (min)	Time to Peak (hrs)
PRE-DEVELOPMENT						
EXT1	99.4	2034	0.25	3.400	83.45	0.83
EXT2	33.1	943	0.25	5.700	47.91	0.48
EXT3	0.53	117	0.25	20.100	11.13	0.11
UNC1	0.4	73	0.25	3.700	15.37	0.15
UNC2	0.74	50	0.25	6.900	10.36	0.10
UNC3	0.27	44	0.25	11.500	8.21	0.08
UNC4	0.14	11	0.25	18.800	3.49	0.03
101	13.9	304	0.25	3.200	32.91	0.33
102	7.8	449	0.25	8.300	29.21	0.29
103	2.42	221	0.25	16.300	16.40	0.16
POST DEVELOPMENT						
EXT1	99.4	2034	0.25	3.400	83.45	0.83
EXT2	33.1	943	0.25	5.700	47.91	0.48
EXT3	0.53	117	0.25	20.100	11.13	0.11
UNC1	0.4	73	0.25	3.700	15.37	0.15
UNC2	0.8	50	0.29	4.000	11.82	0.12
UNC3	0.27	44	0.25	11.500	8.21	0.08
UNC4	0.14	11	0.25	18.800	3.49	0.03
201B	1.08	170	0.32	2.200	25.56	0.26
201C	1.98	132	0.27	2.900	21.88	0.22
201D	5.54	177	0.25	1.040	36.39	0.36
202B	1.55	134	0.26	3.700	20.58	0.21
202C	1.34	165	0.28	4.700	20.61	0.21
202D	1.96	79	0.28	3.900	15.16	0.15
203B	0.52	87	0.33	4.900	13.86	0.14

NOTE: Time to Peak = 0.60Tc

NOTE: Airport method was selected to calculate the watershed time of concentration as per the MOE Drainage Management Manual (for RC less than 0.4) - see below

```
2     Metric units
*#*************************************************************************
*#  Project Name: [ERIN 8TH LINE]    Project Number: [300039324]
*#  Date        : 29-NOV-2018
*#  Modeller    : [A.FRY, J.Scott]
*#  Company     : R.J. Burnside & Associates Ltd
*#  License #   :  3877524
*#*************************************************************************
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[1]
*%                   [Hzl12h15.STM] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
*# ********************************************************************
*# ERIN 8TH LINE HYDROLOGY ANALYSIS - PRE DEVELOPMENT CONDITIONS
*#
*# Model is based on delineations on FIG XX
*# There are 4 points of discharge, the model is set up to show the total flow
*# from the site to these 4 points (A, B, C & D)
*#
*# Storm files are based on Enviro. Canada data from Fergus Shand Dam
*# 3hr Chicago distribution as per Town of Erin standards
*# ********************************************************************
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
* 2-year Storm - 3 hour
CHICAGO STORM       IUNITS=[2],  TD=[3](hrs), TPRAT=[0.33],  CSDT=[5](min),
                    ICASEcs=[2],
                    Enter ordinates of IDF curve below, at least seven points
                        TIME (min)    Intensity(mm/hr)
                          [   5   ]       [ 108.2  ]
                              10             74.2
                              15             63.4
                              30             41.5
                              60             25.6
                              120            15.4
                              360             6.5
                              720             3.7
                              1440            2.2
                                -1            -1
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.74](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.4](mm),
                    N=[3], TP=[0.10]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Total to Point A (from site)
ADD HYD             IDsum=[3], NHYD=["A"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
* Discharges to Point B
* Catchment EXT-1
CALIB NASHYD        ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
```

```
                    N=[3], TP=[0.83]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment 101
CALIB NASHYD        ID=[2], NHYD=["101"], DT=[5]min, AREA=[13.9](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[8.3](mm),
                    N=[3], TP=[0.33]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD        ID=[3], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.08]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[4], NHYD=["B"], IDs to add=[1,2,3]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Total to Point C (from site)
* Catchment 102
CALIB NASHYD        ID=[2], NHYD=["102"], DT=[5]min, AREA=[7.8](ha),
                    DWF=[0](cms),  CN/C=[56], IA=[5.99](mm),
                    N=[3], TP=[0.29]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Total to Point C
ADD HYD             IDsum=[3], NHYD=["C"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Total to Point D (from site)
* Catchment 103
CALIB NASHYD        ID=[2], NHYD=["103"], DT=[1]min, AREA=[2.42](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[4.4](mm),
                    N=[3], TP=[0.16]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[3], NHYD=["D"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
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                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* 5-year Storm - 3 hour
CHICAGO STORM       IUNITS=[2],  TD=[3](hrs), TPRAT=[0.33],  CSDT=[5](min),
                    ICASEcs=[2],
                    Enter ordinates of IDF curve below, at least seven points
                        TIME (min)    Intensity(mm/hr)
                          [   5   ]       [ 139.3  ]
                              10             99.0
                              15             87.6
                              30             60.7
                              60             39.2
                              120            23.0
                              360             9.2
                              720             5.1
                              1440            2.9
                                -1            -1
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.74](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.4](mm),
                    N=[3], TP=[0.10]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Total to Point A (from site)
ADD HYD             IDsum=[3], NHYD=["A"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment EXT-1
CALIB NASHYD        ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
                    N=[3], TP=[0.83]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment 101
CALIB NASHYD        ID=[2], NHYD=["101"], DT=[5]min, AREA=[13.9](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[8.3](mm),
                    N=[3], TP=[0.33]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD        ID=[3], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.08]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[4], NHYD=["B"], IDs to add=[1,2,3]
```

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*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Total to Point C (from site)
* Catchment 102
CALIB NASHYD        ID=[2], NHYD=["102"], DT=[5]min, AREA=[7.8](ha),
                    DWF=[0](cms),  CN/C=[56], IA=[5.99](mm),
                    N=[3], TP=[0.29]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Total to Point C
ADD HYD             IDsum=[3], NHYD=["C"], IDs to add=[1,2]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point D
* Total to Point D (from site)
* Catchment 103
CALIB NASHYD        ID=[2], NHYD=["103"], DT=[1]min, AREA=[2.42](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[4.4](mm),
                    N=[3], TP=[0.16]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[3], NHYD=["D"], IDs to add=[1,2]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* 10-year Storm - 3 hour
CHICAGO STORM       IUNITS=[2],  TD=[3](hrs), TPRAT=[0.33],  CSDT=[5](min),
                    ICASEcs=[2],
                    Enter ordinates of IDF curve below, at least seven points
                        TIME (min)    Intensity(mm/hr)
                          [   5   ]       [ 159.9  ]
                              10            115.4
                              15            103.7
                              30             73.4
                              60             48.3
                              120            28.0
                              360            11.0
                              720             6.0
                              1440            3.4
```

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*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.74](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.4](mm),
                    N=[3], TP=[0.10]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Total to Point A (from site)
ADD HYD             IDsum=[3], NHYD=["A"], IDs to add=[1,2]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment EXT-1
CALIB NASHYD        ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
                    N=[3], TP=[0.83]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 101
CALIB NASHYD        ID=[2], NHYD=["101"], DT=[5]min, AREA=[13.9](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[8.3](mm),
                    N=[3], TP=[0.33]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD        ID=[3], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.08]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[4], NHYD=["B"], IDs to add=[1,2,3]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Total to Point C (from site)
* Catchment 102
CALIB NASHYD        ID=[2], NHYD=["102"], DT=[5]min, AREA=[7.8](ha),
                    DWF=[0](cms),  CN/C=[56], IA=[5.99](mm),
                    N=[3], TP=[0.29]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Total to Point C
ADD HYD             IDsum=[3], NHYD=["C"], IDs to add=[1,2]
```

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*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point D
* Total to Point D (from site)
* Catchment 103
CALIB NASHYD        ID=[2], NHYD=["103"], DT=[1]min, AREA=[2.42](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[4.4](mm),
                    N=[3], TP=[0.16]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[3], NHYD=["D"], IDs to add=[1,2]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* 25-year Storm - 3 hour
CHICAGO STORM       IUNITS=[2],  TD=[3](hrs), TPRAT=[0.33],  CSDT=[5](min),
                    ICASEcs=[2],
                    Enter ordinates of IDF curve below, at least seven points
                        TIME (min)    Intensity(mm/hr)
                          [   5   ]       [ 186.0  ]
                              10            136.2
                              15            124.0
                              30             89.5
                              60             59.7
                              120            34.3
                              360            13.3
                              720             7.1
                              1440            4.0
                                -1            -1
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.74](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.4](mm),
                    N=[3], TP=[0.10]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Total to Point A (from site)
ADD HYD             IDsum=[3], NHYD=["A"], IDs to add=[1,2]
```

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*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment EXT-1
CALIB NASHYD        ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
                    N=[3], TP=[0.83]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 101
CALIB NASHYD        ID=[2], NHYD=["101"], DT=[5]min, AREA=[13.9](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[8.3](mm),
                    N=[3], TP=[0.33]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD        ID=[3], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.08]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[4], NHYD=["B"], IDs to add=[1,2,3]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Total to Point C (from site)
* Catchment 102
CALIB NASHYD        ID=[2], NHYD=["102"], DT=[5]min, AREA=[7.8](ha),
                    DWF=[0](cms),  CN/C=[56], IA=[5.99](mm),
                    N=[3], TP=[0.29]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Total to Point C
ADD HYD             IDsum=[3], NHYD=["C"], IDs to add=[1,2]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point D
* Total to Point D (from site)
* Catchment 103
CALIB NASHYD        ID=[2], NHYD=["103"], DT=[1]min, AREA=[2.42](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[4.4](mm),
                    N=[3], TP=[0.16]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[3], NHYD=["D"], IDs to add=[1,2]
```

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*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* 50-year Storm - 3 hour
CHICAGO STORM       IUNITS=[2],  TD=[3](hrs), TPRAT=[0.33],  CSDT=[5](min),
                    ICASEcs=[2],
                    Enter ordinates of IDF curve below, at least seven points
                        TIME (min)    Intensity(mm/hr)
                          [   5   ]       [ 205.3  ]
                              10            151.6
                              15            139.0
                              30            101.4
                              60             68.2
                              120            39.0
                              360            15.0
                              720             7.9
                              1440            4.4
                                -1            -1
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.74](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.4](mm),
                    N=[3], TP=[0.10]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Total to Point A (from site)
ADD HYD             IDsum=[3], NHYD=["A"], IDs to add=[1,2]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment EXT-1
CALIB NASHYD        ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
                    N=[3], TP=[0.83]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 101
CALIB NASHYD        ID=[2], NHYD=["101"], DT=[5]min, AREA=[13.9](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[8.3](mm),
                    N=[3], TP=[0.33]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD        ID=[3], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
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                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.08]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[4], NHYD=["B"], IDs to add=[1,2,3]
*%------------------|-------------------------------------------------------------|
*%------------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
* Discharges to Point C
* Total to Point C (from site)
* Catchment 102
CALIB NASHYD        ID=[2], NHYD=["102"], DT=[5]min, AREA=[7.8](ha),
                    DWF=[0](cms),  CN/C=[56], IA=[5.99](mm),
                    N=[3], TP=[0.29]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
* Total to Point C
ADD HYD             IDsum=[3], NHYD=["C"], IDs to add=[1,2]
*%------------------|-------------------------------------------------------------|
*%------------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
* Discharges to Point D
* Total to Point D (from site)
* Catchment 103
CALIB NASHYD        ID=[2], NHYD=["103"], DT=[1]min, AREA=[2.42](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[4.4](mm),
                    N=[3], TP=[0.16]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[3], NHYD=["D"], IDs to add=[1,2]
*%------------------|-------------------------------------------------------------|
*%------------------|-------------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|-------------------------------------------------------------|
*%------------------|-------------------------------------------------------------|
* 100-year Storm - 3 hour
CHICAGO STORM       IUNITS=[2],  TD=[3](hrs), TPRAT=[0.33],  CSDT=[5](min),
                    ICASEcs=[2],
                    Enter ordinates of IDF curve below, at least seven points
                        TIME (min)    Intensity(mm/hr)
                          [   5   ]       [ 224.5  ]
                              10            166.9
                              15            153.9
```

```
                                  Pre.dat
                              30            113.3
                              60             76.6
                              120            43.7
                              360            16.6
                              720             8.8
                              1440            4.9
                                -1            -1
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.74](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.4](mm),
                    N=[3], TP=[0.10]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Total to Point A (from site)
ADD HYD             IDsum=[3], NHYD=["A"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment EXT-1
CALIB NASHYD        ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
                    N=[3], TP=[0.83]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment 101
CALIB NASHYD        ID=[2], NHYD=["101"], DT=[5]min, AREA=[13.9](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[8.3](mm),
                    N=[3], TP=[0.33]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD        ID=[3], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.08]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[4], NHYD=["B"], IDs to add=[1,2,3]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Total to Point C (from site)
* Catchment 102
CALIB NASHYD        ID=[2], NHYD=["102"], DT=[5]min, AREA=[7.8](ha),
```

```
                    DWF=[0](cms),  CN/C=[56], IA=[5.99](mm),
                    N=[3], TP=[0.29]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Total to Point C
ADD HYD             IDsum=[3], NHYD=["C"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Total to Point D (from site)
* Catchment 103
CALIB NASHYD        ID=[2], NHYD=["103"], DT=[1]min, AREA=[2.42](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[4.4](mm),
                    N=[3], TP=[0.16]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[3], NHYD=["D"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* UPGRADED CN NUMBER TO AMC III CONDITIONS FOR REGIONAL STORM PER
* RECOMMENDATIONS FOR 12 HOUR STORM FILE
*%-----------------|-------------------------------------------------------------|
*REGIONAL STORM HURRICANE HAZEL (12-HOUR WITH ANTECEDENT CONDITIONS)
*
READ STORM          STORM_FILENAME=["Hzl12h15.STM"]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.74](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.4](mm),
                    N=[3], TP=[0.10]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Total to Point A (from site)
ADD HYD             IDsum=[3], NHYD=["A"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
```

```
* Catchment EXT-1
CALIB NASHYD        ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
                    N=[3], TP=[0.83]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Discharges to Point B
* Catchment 101
CALIB NASHYD        ID=[2], NHYD=["101"], DT=[5]min, AREA=[13.9](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[8.3](mm),
                    N=[3], TP=[0.33]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD        ID=[3], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.08]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[4], NHYD=["B"], IDs to add=[1,2,3]
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Discharges to Point C
* Total to Point C (from site)
* Catchment 102
CALIB NASHYD        ID=[2], NHYD=["102"], DT=[5]min, AREA=[7.8](ha),
                    DWF=[0](cms),  CN/C=[56], IA=[5.99](mm),
                    N=[3], TP=[0.29]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Total to Point C
ADD HYD             IDsum=[3], NHYD=["C"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Discharges to Point D
* Total to Point D (from site)
* Catchment 103
CALIB NASHYD        ID=[2], NHYD=["103"], DT=[1]min, AREA=[2.42](ha),
                    DWF=[0](cms),  CN/C=[64], IA=[4.4](mm),
                    N=[3], TP=[0.16]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[3], NHYD=["D"], IDs to add=[1,2]
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
```

```
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
FINISH
```

```
   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
       S   W W   M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9   =========
                                                        9   9  9   9   # 3877524
        StormWater Management HYdrologic Model           999    999    =========

 ********************************************************************************
 ***************************** SWMHYMO Ver/4.05  ********************************
 *********  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: R.J. Burnside & Associates Ltd                +++++++++
 +++++++++                Brampton              SERIAL#:3877524        +++++++++
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ********************************************************************************
 *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
 *********           Maximum value for ID numbers  :     10            *********
 *********           Max. number of rainfall points: 105408            *********
 *********           Max. number of flow points    : 105408            *********
 ********************************************************************************

 ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
 *****-------------------------------------------------------------------*****
 *****    ID:  Hydrograph IDentification numbers, (1-10).                 *****
 *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).    *****
 *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).  *****
 ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).    *****
 ***** TpeakDate_hh:mm is the date and time of the peak flow.             *****
 *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).       *****
 *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).       *****
 *****     *:  see WARNING or NOTE message printed at end of run.         *****
 *****    **:  see  ERROR  message printed at end of run.                 *****
 ********************************************************************************
 ********************************************************************************

::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

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

 **********************   S U M M A R Y   O U T P U T   **********************
 ********************************************************************************
 *         DATE: 2018-12-03     TIME: 20:46:24     RUN COUNTER: 001705          *
 ********************************************************************************
 * Input   filename: C:\SWMHYMO\8THLIN~1\181203\Pre.dat                          *
 * Output  filename: C:\SWMHYMO\8THLIN~1\181203\Pre.out                          *
 * Summary filename: C:\SWMHYMO\8THLIN~1\181203\Pre.sum                          *
 * User comments:                                                               *
 * 1:_____________________________________________________________________________*
 * 2:_____________________________________________________________________________*
 * 3:_____________________________________________________________________________*
```

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


#*******************************************************************************
#  Project Name: [ERIN 8TH LINE]    Project Number: [300039324]
#  Date        : 29-NOV-2018
#  Modeller    : [A.FRY, J.Scott]
#  Company     : R.J. Burnside & Associates Ltd
#  License #   :  3877524
#*******************************************************************************
 RUN:COMMAND#

001:0001-------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   1 ]
# ***********************************************************************
# ERIN 8TH LINE HYDROLOGY ANALYSIS - PRE DEVELOPMENT CONDITIONS
#
# Model is based on delineations on FIG XX
# There are 4 points of discharge, the model is set up to show the total flow
# from the site to these 4 points (A, B, C & D)
#
# Storm files are based on Enviro. Canada data from Fergus Shand Dam
# 3hr Chicago distribution as per Town of Erin standards
# ***********************************************************************

001:0002-------------------------------------------------------------------------
     CHICAGO STORM
      [SDT= 5.00:SDUR=   3.00:PTOT=  33.49]
      {A/B/C= 719.435/   6.193/    .797: R=.9999}

001:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1            .40     .003 No_date    1:16    2.86 .085
      [CN= 60.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2            .74     .015 No_date    1:09    5.20 .155
      [CN= 69.0: N= 3.00]
      [Tp=  .10:DT= 1.00]

001:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:UNC-1            .40     .003 No_date    1:16    2.86  n/a
                      +  02:UNC-2            .74     .015 No_date    1:09    5.20  n/a
      [DT= 1.00]  SUM=  03:A               1.14     .018 No_date    1:10    4.38  n/a

001:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-1           99.40     .303 No_date    2:15    2.50 .075
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:101             13.90     .110 No_date    1:30    3.78 .113
      [CN= 64.0: N= 3.00]
      [Tp=  .33:DT= 5.00]

001:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:UNC-3            .27     .003 No_date    1:09    2.86 .085
      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]
```

```
001:0009---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1          99.40     .303 No_date    2:15    2.50  n/a
                    +   02:101            13.90     .110 No_date    1:30    3.78  n/a
                    +   03:UNC-3            .27     .003 No_date    1:09    2.86  n/a
      [DT= 1.00]  SUM=  04:B             113.57     .364 No_date    2:05    2.65  n/a

001:0010---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-2          33.10     .147 No_date    1:45    2.59 .077
      [CN= 51.0: N= 3.00]
      [Tp=  .48:DT= 5.00]

001:0011---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:102            7.80     .060 No_date    1:25    3.33 .099
      [CN= 56.0: N= 3.00]
      [Tp=  .29:DT= 5.00]

001:0012---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-2          33.10     .147 No_date    1:45    2.59  n/a
                    +   02:102            7.80     .060 No_date    1:25    3.33  n/a
      [DT= 5.00]  SUM=  03:C             40.90     .197 No_date    1:35    2.73  n/a

001:0013---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-3            .53     .002 No_date    1:12    1.16 .035
      [CN= 36.0: N= 3.00]
      [Tp=  .11:DT= 1.00]

001:0014---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:103            2.42     .040 No_date    1:13    4.92 .147
      [CN= 64.0: N= 3.00]
      [Tp=  .16:DT= 1.00]

001:0015---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-3            .53     .002 No_date    1:12    1.16  n/a
                    +   02:103            2.42     .040 No_date    1:13    4.92  n/a
      [DT= 1.00]  SUM=  03:D             2.95     .042 No_date    1:13    4.25  n/a

001:0016---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4            .14     .002 No_date    1:05    2.86 .085
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0017---------------------------------------------------------------------------
     CHICAGO STORM
      [SDT= 5.00:SDUR=   3.00:PTOT=  49.22]
      {A/B/C=1525.827/  12.117/    .862: R=.9997}

001:0018---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1            .40     .010 No_date    1:15    7.38 .150
      [CN= 60.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0019---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2            .74     .036 No_date    1:09   11.68 .237
      [CN= 69.0: N= 3.00]
      [Tp=  .10:DT= 1.00]

001:0020---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:UNC-1            .40     .010 No_date    1:15    7.38  n/a
                    +   02:UNC-2            .74     .036 No_date    1:09   11.68  n/a
      [DT= 1.00]  SUM=  03:A              1.14     .045 No_date    1:10   10.17  n/a

001:0021---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
     CALIB NASHYD       01:EXT-1         99.40     .803 No_date    2:10    6.23 .127
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:101           13.90     .292 No_date    1:30    9.11 .185
      [CN= 64.0: N= 3.00]
      [Tp=  .33:DT= 5.00]

001:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:UNC-3           .27     .008 No_date    1:08    7.38 .150
      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]

001:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1         99.40     .803 No_date    2:10    6.23  n/a
                    +   02:101           13.90     .292 No_date    1:30    9.11  n/a
                    +   03:UNC-3           .27     .008 No_date    1:08    7.38  n/a
      [DT= 1.00]   SUM=  04:B            113.57     .960 No_date    2:00    6.59  n/a

001:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-2         33.10     .380 No_date    1:40    6.23 .127
      [CN= 51.0: N= 3.00]
      [Tp=  .48:DT= 5.00]

001:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:102            7.80     .150 No_date    1:25    7.70 .156
      [CN= 56.0: N= 3.00]
      [Tp=  .29:DT= 5.00]

001:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-2         33.10     .380 No_date    1:40    6.23  n/a
                    +   02:102            7.80     .150 No_date    1:25    7.70  n/a
      [DT= 5.00]   SUM=  03:C            40.90     .507 No_date    1:35    6.51  n/a

001:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-3           .53     .006 No_date    1:12    3.13 .064
      [CN= 36.0: N= 3.00]
      [Tp=  .11:DT= 1.00]

001:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:103            2.42     .090 No_date    1:14   10.70 .217
      [CN= 64.0: N= 3.00]
      [Tp=  .16:DT= 1.00]

001:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-3           .53     .006 No_date    1:12    3.13  n/a
                    +   02:103            2.42     .090 No_date    1:14   10.70  n/a
      [DT= 1.00]   SUM=  03:D              2.95     .096 No_date    1:14    9.34  n/a

001:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4           .14     .005 No_date    1:01    7.38 .150
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0032--------------------------------------------------------------------------------
     CHICAGO STORM
      [SDT= 5.00:SDUR=   3.00:PTOT=  59.85]
      {A/B/C=2179.495/  15.119/    .890: R=.9997}

001:0033--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1           .40     .015 No_date    1:15   11.34 .189
      [CN= 60.0: N= 3.00]
```

```
      [Tp=  .15:DT= 1.00]

001:0034---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2            .74     .053 No_date    1:09   17.05 .285
      [CN= 69.0: N= 3.00]
      [Tp=  .10:DT= 1.00]

001:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:UNC-1            .40     .015 No_date    1:15   11.34  n/a
                    +   02:UNC-2            .74     .053 No_date    1:09   17.05  n/a
      [DT= 1.00]  SUM=  03:A               1.14     .067 No_date    1:10   15.04  n/a

001:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-1          99.40    1.252 No_date    2:10    9.53 .159
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:101            13.90     .450 No_date    1:30   13.67 .228
      [CN= 64.0: N= 3.00]
      [Tp=  .33:DT= 5.00]

001:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:UNC-3            .27     .013 No_date    1:08   11.34 .189
      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]

001:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1          99.40    1.252 No_date    2:10    9.53  n/a
                    +   02:101            13.90     .450 No_date    1:30   13.67  n/a
                    +   03:UNC-3            .27     .013 No_date    1:08   11.34  n/a
      [DT= 1.00]  SUM=  04:B              113.57    1.491 No_date    2:00   10.04  n/a

001:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-2          33.10     .587 No_date    1:40    9.41 .157
      [CN= 51.0: N= 3.00]
      [Tp=  .48:DT= 5.00]

001:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:102             7.80     .228 No_date    1:25   11.45 .191
      [CN= 56.0: N= 3.00]
      [Tp=  .29:DT= 5.00]

001:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-2          33.10     .587 No_date    1:40    9.41  n/a
                    +   02:102             7.80     .228 No_date    1:25   11.45  n/a
      [DT= 5.00]  SUM=  03:C              40.90     .779 No_date    1:35    9.80  n/a

001:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-3            .53     .010 No_date    1:12    4.96 .083
      [CN= 36.0: N= 3.00]
      [Tp=  .11:DT= 1.00]

001:0044---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:103             2.42     .132 No_date    1:14   15.50 .259
      [CN= 64.0: N= 3.00]
      [Tp=  .16:DT= 1.00]

001:0045---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-3            .53     .010 No_date    1:12    4.96  n/a
                    +   02:103             2.42     .132 No_date    1:14   15.50  n/a
      [DT= 1.00]  SUM=  03:D               2.95     .141 No_date    1:14   13.61  n/a
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001:0046---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4            .14     .008 No_date    1:01   11.34 .189
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0047--------------------------------------------------------------------------------
     CHICAGO STORM
      [SDT= 5.00:SDUR=   3.00:PTOT=  73.34]
      {A/B/C=3140.255/  18.189/    .918: R=.9996}

001:0048---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1            .40     .024 No_date    1:15   17.24 .235
      [CN= 60.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0049---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2            .74     .077 No_date    1:09   24.75 .337
      [CN= 69.0: N= 3.00]
      [Tp=  .10:DT= 1.00]

001:0050---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:UNC-1            .40     .024 No_date    1:15   17.24  n/a
                    +   02:UNC-2            .74     .077 No_date    1:09   24.75  n/a
      [DT= 1.00]   SUM=  03:A              1.14     .099 No_date    1:10   22.11  n/a

001:0051---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-1           99.40    1.934 No_date    2:10   14.49 .198
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0052---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:101             13.90     .683 No_date    1:30   20.34 .277
      [CN= 64.0: N= 3.00]
      [Tp=  .33:DT= 5.00]

001:0053---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:UNC-3            .27     .020 No_date    1:07   17.24 .235
      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]

001:0054---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1           99.40    1.934 No_date    2:10   14.49  n/a
                    +   02:101             13.90     .683 No_date    1:30   20.34  n/a
                    +   03:UNC-3             .27     .020 No_date    1:07   17.24  n/a
      [DT= 1.00]   SUM=  04:B             113.57    2.296 No_date    2:00   15.21  n/a

001:0055---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-2           33.10     .901 No_date    1:40   14.18 .193
      [CN= 51.0: N= 3.00]
      [Tp=  .48:DT= 5.00]

001:0056---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:102              7.80     .343 No_date    1:25   16.99 .232
      [CN= 56.0: N= 3.00]
      [Tp=  .29:DT= 5.00]

001:0057---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-2           33.10     .901 No_date    1:40   14.18  n/a
                    +   02:102              7.80     .343 No_date    1:25   16.99  n/a
      [DT= 5.00]   SUM=  03:C              40.90    1.191 No_date    1:35   14.71  n/a

001:0058---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-3            .53     .015 No_date    1:11    7.79 .106
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      [CN= 36.0: N= 3.00]
      [Tp=  .11:DT= 1.00]

001:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:103            2.42     .191 No_date    1:14   22.44 .306
      [CN= 64.0: N= 3.00]
      [Tp=  .16:DT= 1.00]

001:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-3           .53     .015 No_date    1:11    7.79  n/a
                    +   02:103            2.42     .191 No_date    1:14   22.44  n/a
      [DT= 1.00]  SUM=  03:D              2.95     .206 No_date    1:14   19.80  n/a

001:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4           .14     .012 No_date    1:01   17.24 .235
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0062--------------------------------------------------------------------------------
     CHICAGO STORM
      [SDT= 5.00:SDUR=   3.00:PTOT=  83.51]
      {A/B/C=4206.008/  21.190/    .946: R=.9996}

001:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1           .40     .031 No_date    1:15   22.25 .266
      [CN= 60.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2           .74     .097 No_date    1:09   31.09 .372
      [CN= 69.0: N= 3.00]
      [Tp=  .10:DT= 1.00]

001:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:UNC-1           .40     .031 No_date    1:15   22.25  n/a
                    +   02:UNC-2           .74     .097 No_date    1:09   31.09  n/a
      [DT= 1.00]  SUM=  03:A              1.14     .125 No_date    1:10   27.99  n/a

001:0066--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-1         99.40    2.531 No_date    2:10   18.74 .224
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0067--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:101           13.90     .883 No_date    1:30   25.94 .311
      [CN= 64.0: N= 3.00]
      [Tp=  .33:DT= 5.00]

001:0068--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:UNC-3           .27     .026 No_date    1:07   22.25 .266
      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]

001:0069--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1         99.40    2.531 No_date    2:10   18.74  n/a
                    +   02:101           13.90     .883 No_date    1:30   25.94  n/a
                    +   03:UNC-3           .27     .026 No_date    1:07   22.25  n/a
      [DT= 1.00]  SUM=  04:B            113.57    2.999 No_date    2:00   19.63  n/a

001:0070--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-2         33.10    1.176 No_date    1:40   18.26 .219
      [CN= 51.0: N= 3.00]
      [Tp=  .48:DT= 5.00]
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001:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:102            7.80     .442 No_date    1:25   21.69 .260
      [CN= 56.0: N= 3.00]
      [Tp=  .29:DT= 5.00]

001:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-2         33.10    1.176 No_date    1:40   18.26  n/a
                    +   02:102            7.80     .442 No_date    1:25   21.69  n/a
      [DT= 5.00]   SUM=  03:C             40.90    1.550 No_date    1:35   18.91  n/a

001:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-3           .53     .020 No_date    1:12   10.29 .123
      [CN= 36.0: N= 3.00]
      [Tp=  .11:DT= 1.00]

001:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:103            2.42     .241 No_date    1:14   28.19 .338
      [CN= 64.0: N= 3.00]
      [Tp=  .16:DT= 1.00]

001:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-3           .53     .020 No_date    1:12   10.29  n/a
                    +   02:103            2.42     .241 No_date    1:14   28.19  n/a
      [DT= 1.00]   SUM=  03:D             2.95     .261 No_date    1:14   24.98  n/a

001:0076---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4           .14     .016 No_date    1:01   22.25 .266
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0077---------------------------------------------------------------------------
     CHICAGO STORM
      [SDT= 5.00:SDUR=   3.00:PTOT=  93.30]
      {A/B/C=4789.414/  21.844/    .949: R=.9996}

001:0078---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1           .40     .039 No_date    1:15   27.47 .294
      [CN= 60.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0079---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2           .74     .117 No_date    1:08   37.57 .403
      [CN= 69.0: N= 3.00]
      [Tp=  .10:DT= 1.00]

001:0080---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:UNC-1           .40     .039 No_date    1:15   27.47  n/a
                    +   02:UNC-2           .74     .117 No_date    1:08   37.57  n/a
      [DT= 1.00]   SUM=  03:A            1.14     .152 No_date    1:10   34.02  n/a

001:0081---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-1         99.40    3.139 No_date    2:10   23.19 .249
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0082---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:101           13.90    1.083 No_date    1:30   31.71 .340
      [CN= 64.0: N= 3.00]
      [Tp=  .33:DT= 5.00]

001:0083---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:UNC-3           .27     .032 No_date    1:07   27.47 .294
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      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]

001:0084---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1          99.40    3.139 No_date    2:10   23.19  n/a
                    +   02:101            13.90    1.083 No_date    1:30   31.71  n/a
                    +   03:UNC-3            .27     .032 No_date    1:07   27.47  n/a
      [DT= 1.00]  SUM=  04:B             113.57    3.711 No_date    2:00   24.25  n/a

001:0085---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-2          33.10    1.456 No_date    1:40   22.55 .242
      [CN= 51.0: N= 3.00]
      [Tp=  .48:DT= 5.00]

001:0086---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:102             7.80     .543 No_date    1:25   26.57 .285
      [CN= 56.0: N= 3.00]
      [Tp=  .29:DT= 5.00]

001:0087---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-2          33.10    1.456 No_date    1:40   22.55  n/a
                    +   02:102             7.80     .543 No_date    1:25   26.57  n/a
      [DT= 5.00]  SUM=  03:C             40.90    1.916 No_date    1:35   23.31  n/a

001:0088---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-3            .53     .025 No_date    1:11   12.97 .139
      [CN= 36.0: N= 3.00]
      [Tp=  .11:DT= 1.00]

001:0089---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:103             2.42     .292 No_date    1:14   34.10 .365
      [CN= 64.0: N= 3.00]
      [Tp=  .16:DT= 1.00]

001:0090---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-3            .53     .025 No_date    1:11   12.97  n/a
                    +   02:103             2.42     .292 No_date    1:14   34.10  n/a
      [DT= 1.00]  SUM=  03:D               2.95     .317 No_date    1:14   30.30  n/a

001:0091---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4            .14     .019 No_date    1:01   27.47 .294
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0092---------------------------------------------------------------------------
     READ STORM
      Filename = Hzl12h15.STM
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT= 212.00]

001:0093---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1            .40     .041 No_date   10:01  109.88 .518
      [CN= 60.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0094---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2            .74     .088 No_date   10:00  132.21 .624
      [CN= 69.0: N= 3.00]
      [Tp=  .10:DT= 1.00]

001:0095---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:UNC-1            .40     .041 No_date   10:01  109.88  n/a
                    +   02:UNC-2            .74     .088 No_date   10:00  132.21  n/a
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      [DT= 1.00]  SUM=  03:A              1.14     .129 No_date   10:00  124.38  n/a

001:0096---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-1          99.40    7.075 No_date   11:05   96.59 .456
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0097---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:101            13.90    1.444 No_date   10:05  119.72 .565
      [CN= 64.0: N= 3.00]
      [Tp=  .33:DT= 5.00]

001:0098---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:UNC-3            .27     .028 No_date   10:00  109.88 .518
      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]

001:0099---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1          99.40    7.075 No_date   11:05   96.59  n/a
                    +   02:101            13.90    1.444 No_date   10:05  119.72  n/a
                    +   03:UNC-3            .27     .028 No_date   10:00  109.88  n/a
      [DT= 1.00]  SUM=  04:B             113.57    8.254 No_date   11:00   99.45  n/a

001:0100---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-2          33.10    2.538 No_date   10:20   93.59 .441
      [CN= 51.0: N= 3.00]
      [Tp=  .48:DT= 5.00]

001:0101---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:102             7.80     .727 No_date   10:05  104.64 .494
      [CN= 56.0: N= 3.00]
      [Tp=  .29:DT= 5.00]

001:0102---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-2          33.10    2.538 No_date   10:20   93.59  n/a
                    +   02:102             7.80     .727 No_date   10:05  104.64  n/a
      [DT= 5.00]  SUM=  03:C             40.90    3.222 No_date   10:15   95.70  n/a

001:0103---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-3            .53     .033 No_date   10:01   62.43 .294
      [CN= 36.0: N= 3.00]
      [Tp=  .11:DT= 1.00]

001:0104---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:103             2.42     .268 No_date   10:01  122.97 .580
      [CN= 64.0: N= 3.00]
      [Tp=  .16:DT= 1.00]

001:0105---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-3            .53     .033 No_date   10:01   62.43  n/a
                    +   02:103             2.42     .268 No_date   10:01  122.97  n/a
      [DT= 1.00]  SUM=  03:D              2.95     .301 No_date   10:01  112.09  n/a

001:0106---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4            .14     .015 No_date   10:00  109.88 .518
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0107---------------------------------------------------------------------------
      FINISH
-------------------------------------------------------------------------------
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*
     WARNINGS / ERRORS / NOTES
     -------------------------
 001:0016 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0031 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0046 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0061 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0076 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0091 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0106 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
   Simulation ended on 2018-12-03     at 20:46:28
================================================================================
=
```

```
2     Metric units
*#*************************************************************************
*#  Project Name: [Erin 8th Line]    Project Number: [300039324]
*#  Date        : 3-DEC-2018
*#  Modeller    : [J.Scott]
*#  Company     : R. J. Burnside & Associates Ltd.
*#  License #   :  3877524
*#*************************************************************************
*# ERIN 8TH LINE HYDROLOGY ANALYSIS - INFILTRATION REQUIREMENTS
*#
*# Model created to establish flow rates assciated with the 25mm storm to
*# understand flow that is to be infiltrated from roofs and a portion of the ROW
*#
*# 25mm flow from roofs will directly discharge to infiltration trenches
*# 25mm flow from a portion of the ROW on the east side of the site will
*# discharge to a bioretention cell
*#
*#*************************************************************************
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[0],  NRUN=[0]
*%                   [  ] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
MASS STORM          PTOTAL=[25](mm), CSDT=[10](min),
                    CURVE_FILENAME=["4hr-chi.mst"]
*%-----------------|-------------------------------------------------------|
*#*************************************************************************
*# POST DEVELOPMENT
*#*************************************************************************
* Flow from one roof top
DESIGN STANDHYD     ID=[1], NHYD=["Roof"], DT=[1]min, AREA=[0.0328](ha),
                    XIMP=[0.01], TIMP=[0.99], DWF=[0](cms), LOSS=[2], CN=[100],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------|
* Flow from asphalt in ROW on east side that will discharge to LID
DESIGN STANDHYD     ID=[1], NHYD=["ROW"], DT=[1]min, AREA=[0.1718](ha),
                    XIMP=[0.01], TIMP=[0.99], DWF=[0](cms), LOSS=[2], CN=[100],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
FINISH
```

```
   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
       S   W W   M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9   =========
                                                        9   9  9   9   # 3877524
        StormWater Management HYdrologic Model           999    999    =========

 ********************************************************************************
 ***************************** SWMHYMO Ver/4.05  ********************************
 *********  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: R.J. Burnside & Associates Ltd                +++++++++
 +++++++++                Brampton              SERIAL#:3877524        +++++++++
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ********************************************************************************
 *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
 *********           Maximum value for ID numbers  :     10            *********
 *********           Max. number of rainfall points: 105408            *********
 *********           Max. number of flow points    : 105408            *********
 ********************************************************************************


 ***********************   D E T A I L E D   O U T P U T   **********************
 ********************************************************************************
 *         DATE: 2018-12-03     TIME: 22:09:48     RUN COUNTER: 001710          *
 ********************************************************************************
 * Input   filename: C:\SWMHYMO\8THLIN~1\181203\25mm.dat                         *
 * Output  filename: C:\SWMHYMO\8THLIN~1\181203\25mm.out                         *
 * Summary filename: C:\SWMHYMO\8THLIN~1\181203\25mm.sum                         *
 * User comments:                                                               *
 * 1:_____________________________________________________________________________*
 * 2:_____________________________________________________________________________*
 * 3:_____________________________________________________________________________*
 ********************************************************************************

--------------------------------------------------------------------------------
-
001:0001--------------------------------------------------------------------------
-
*#*****************************************************************************
*#  Project Name: [Erin 8th Line]    Project Number: [300039324]
*#  Date        : 3-DEC-2018
*#  Modeller    : [J.Scott]
*#  Company     : R. J. Burnside & Associates Ltd.
*#  License #   :  3877524
*#*****************************************************************************
*# ERIN 8TH LINE HYDROLOGY ANALYSIS - INFILTRATION REQUIREMENTS
*#
*# Model created to establish flow rates assciated with the 25mm storm to
*# understand flow that is to be infiltrated from roofs and a portion of the ROW
```

```
*#
*# 25mm flow from roofs will directly discharge to infiltration trenches
*# 25mm flow from a portion of the ROW on the east side of the site will
*# discharge to a bioretention cell
*#
*#*************************************************************************
--------------------
| START            |  Project  dir.: C:\SWMHYMO\8THLIN~1\181203\
--------------------  Rainfall dir.: C:\SWMHYMO\8THLIN~1\181203\

    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   0
-------------------------------------------------------------------------------
-
001:0002----------------------------------------------------------------------
-
--------------------
| MASS STORM       |    Filename: C:\SWMHYMO\8THLIN~1\181203\4hr-chi.mst
| Ptotal= 25.00 mm |    Comments: 4 Hour, Chicago Distribution with 10 min
--------------------
                       Duration of storm        =    4.17 hrs
                       Mass curve time step     =   10.00 min
                       Selected storm time step =   10.00 min
                       Volume of derived storm  =   25.00 mm

             TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
              hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
              .17   1.500 |   1.33  36.300 |   2.50   2.850 |   3.67   1.500
              .33   2.100 |   1.50  23.550 |   2.67   2.400 |   3.83   1.050
              .50   2.250 |   1.67   9.900 |   2.83   2.250 |   4.00    .600
              .67   2.550 |   1.83   6.300 |   3.00   2.100 |   4.17    .300
              .83   4.050 |   2.00   4.800 |   3.17   1.800 |
             1.00   7.500 |   2.17   3.900 |   3.33   1.650 |
             1.17  24.000 |   2.33   3.150 |   3.50   1.650 |

-------------------------------------------------------------------------------
-
001:0003----------------------------------------------------------------------
-
*#*************************************************************************
*# POST DEVELOPMENT
*#*************************************************************************
* Flow from one roof top
----------------------
| DESIGN STANDHYD    |   Area    (ha)=     .03
| 01:Roof   DT= 1.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=    1.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .03          .00
     Dep. Storage     (mm)=        .80         1.50
     Average Slope     (%)=       2.00         2.00
     Length            (m)=      14.79        40.00
     Mannings n             =      .013         .250

     Max.eff.Inten.(mm/hr)=      36.30      3593.71
               over (min)         1.00         3.00
     Storage Coeff.  (min)=        .99 (ii)    2.67 (ii)
     Unit Hyd. Tpeak (min)=       1.00         3.00
     Unit Hyd. peak  (cms)=       1.08          .41
                                                    *TOTALS*
```

PEAK FLOW	(cms)=	.00	.00	.003 (iii)
TIME TO PEAK	(hrs)=	1.27	1.33	1.333
RUNOFF VOLUME	(mm)=	24.20	24.98	24.977
TOTAL RAINFALL	(mm)=	25.00	25.00	25.000
RUNOFF COEFFICIENT	=	.97	1.00	.999

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 100.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

001:0004

---

* Flow from asphalt in ROW on east side that will discharge to LID

DESIGN STANDHYD	Area (ha)= .17
01:ROW DT= 1.00	Total Imp(%)= 99.00 Dir. Conn.(%)= 1.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	.17	.00	
Dep. Storage	(mm)=	.80	1.50	
Average Slope	(%)=	2.00	2.00	
Length	(m)=	33.84	40.00	
Mannings n	=	.013	.250	
Max.eff.Inten.(mm/hr)=		36.30	3593.71	
over (min)		2.00	3.00	
Storage Coeff.	(min)=	1.62 (ii)	3.31 (ii)	
Unit Hyd. Tpeak	(min)=	2.00	3.00	
Unit Hyd. peak	(cms)=	.64	.35	
				TOTALS
PEAK FLOW	(cms)=	.00	.02	.017 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.333
RUNOFF VOLUME	(mm)=	24.20	24.98	24.977
TOTAL RAINFALL	(mm)=	25.00	25.00	25.000
RUNOFF COEFFICIENT	=	.97	1.00	.999

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 100.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

001:0005

FINISH

****

WARNINGS / ERRORS / NOTES

Simulation ended on 2018-12-03 at 22:09:49

==========

```
2     Metric units
*#*************************************************************************
*#  Project Name: [ERIN 8TH LINE]    Project Number: [300039324]
*#  Date        : 29-NOV-2018
*#  Modeller    : [A.FRY, J.Scott]
*#  Company     : R.J. Burnside & Associates Ltd
*#  License #   :  3877524
*#*************************************************************************
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[1]
*%                   [Hzl12h15.STM] <--storm filename, one per line for NSTORM time
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
*# ******************************************************************
*# ERIN 8TH LINE HYDROLOGY ANALYSIS - POST DEVELOPMENT CONDITIONS
*#
*# Model is based on delineations on FIG XX
*# There are 4 points of discharge, the model is set up to show the total flow
*# from the site to these 4 points (A, B, C & D)
*#
*# Flow to infiltrated by LIDs based on 25mm model
*# (25mm discharge off 1 FULL ROOF = 0.003cms)
*#
*# Storm files are based on Enviro. Canada data from Fergus Shand Dam
*# 3hr Chicago distribution as per Town of Erin standards
*# ******************************************************************
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
* 2-year Storm - 3 hour
CHICAGO STORM       IUNITS=[2],  TD=[3](hrs), TPRAT=[0.33],  CSDT=[5](min),
                    ICASEcs=[2],
                    Enter ordinates of IDF curve below, at least seven points
                        TIME (min)    Intensity(mm/hr)
                          [   5   ]       [ 108.2  ]
                              10             74.2
                              15             63.4
                              30             41.5
                              60             25.6
                              120            15.4
                              360             6.5
                              720             3.7
                              1440            2.2
                                -1            -1
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.80](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.6](mm),
                    N=[3], TP=[0.12]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
```

```
*%-----------------|---------------------------------------------------------|
* Total to Point A (from site)
ADD HYD            IDsum=[5], NHYD=["A"], IDs to add=[1,3]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment EXT-1
CALIB NASHYD       ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                   DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
                   N=[3], TP=[0.83]hrs,
                   RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD       ID=[2], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
                   DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                   N=[3], TP=[0.08]hrs,
                   RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD    ID=[3], NHYD=["201A"], DT=[1]min, AREA=[5.06](ha),
                   XIMP=[0.01], TIMP=[0.24], DWF=[0](cms), LOSS=[2], CN=[62],
                   SLOPE=[4](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 10 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD    IDin=[3], CINLET=[0.021](cms), NINLET=[1],
                   MAJID=[4], MajNHYD=["remainder"],
                   MINID=[5], MinNHYD=["LID"],
                   TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201B (rear of lots)
CALIB NASHYD       ID=[3], NHYD=["201B"], DT=[1]min, AREA=[1.08](ha),
                   DWF=[0](cms),  CN/C=[68], IA=[7.3](mm),
                   N=[3], TP=[0.26]hrs,
                   RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD    IDin=[3], CINLET=[0.0045](cms), NINLET=[1],
                   MAJID=[5], MajNHYD=["remainder"],
                   MINID=[6], MinNHYD=["LID"],
                   TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201C (rear of lots)
CALIB NASHYD       ID=[3], NHYD=["201C"], DT=[5]min, AREA=[1.98](ha),
                   DWF=[0](cms),  CN/C=[66], IA=[7.5](mm),
                   N=[3], TP=[0.22]hrs,
                   RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD    IDin=[3], CINLET=[0.006](cms), NINLET=[1],
                   MAJID=[6], MajNHYD=["remainder"],
                   MINID=[7], MinNHYD=["LID"],
                   TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201D (natural area, drains directly to existing outlet)
CALIB NASHYD       ID=[7], NHYD=["201D"], DT=[5]min, AREA=[5.54](ha),
                   DWF=[0](cms),  CN/C=[60], IA=[10.0](mm),
                   N=[3], TP=[0.36]hrs,
                   RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
```

```
*%-----------------|---------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[8], NHYD=["B"], IDs to add=[1,2,4,5,6,7]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["202A"], DT=[1]min, AREA=[3.05](ha),
                    XIMP=[0.01], TIMP=[0.249], DWF=[0](cms), LOSS=[2], CN=[51],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 11 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0225](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202B"], DT=[5]min, AREA=[1.55](ha),
                    DWF=[0](cms),  CN/C=[41], IA=[9](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 2 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.003](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202C (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202C"], DT=[1]min, AREA=[1.34](ha),
                    DWF=[0](cms),  CN/C=[47], IA=[7.7](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.006](cms), NINLET=[1],
                    MAJID=[5], MajNHYD=["remainder"],
                    MINID=[6], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202D (natural area, drains directly to existing outlet)
CALIB NASHYD        ID=[2], NHYD=["202D"], DT=[1]min, AREA=[1.96](ha),
                    DWF=[0](cms),  CN/C=[45], IA=[8.2](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 6 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.009](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["remainder"],
                    MINID=[7], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
```

```
* Total to Point C
ADD HYD             IDsum=[7], NHYD=["C"], IDs to add=[1,3,4,5,6]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment 203A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["203A"], DT=[1]min, AREA=[1.96](ha),
                    XIMP=[0.01], TIMP=[0.313], DWF=[0](cms), LOSS=[2], CN=[53],
                    SLOPE=[3](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 4 ROOFS & 4 FULL ROOFS will discharge to infiltration trench
*Asphalt from the ROW will discharge to an LID in the cul-de-sac (0.017cms)
COMPUTE DUALHYD     IDin=[2], CINLET=[0.035](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment 203B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["203B"], DT=[1]min, AREA=[0.52](ha),
                    DWF=[0](cms),  CN/C=[58], IA=[5.5](mm),
                    N=[3], TP=[0.14]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[4], NHYD=["D"], IDs to add=[1,3,4]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* 5-year Storm - 3 hour
CHICAGO STORM       IUNITS=[2],  TD=[3](hrs), TPRAT=[0.33],  CSDT=[5](min),
                    ICASEcs=[2],
                    Enter ordinates of IDF curve below, at least seven points
                        TIME (min)    Intensity(mm/hr)
                          [   5   ]       [ 139.3  ]
                              10             99.0
                              15             87.6
                              30             60.7
                              60             39.2
                              120            23.0
                              360             9.2
                              720             5.1
```

```
                          1440            2.9
                            -1            -1
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.80](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.6](mm),
                    N=[3], TP=[0.12]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------|
* Total to Point A (from site)
ADD HYD             IDsum=[5], NHYD=["A"], IDs to add=[1,3]
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
* Discharges to Point B
* Catchment EXT-1
CALIB NASHYD        ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
                    N=[3], TP=[0.83]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD        ID=[2], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.08]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Discharges to Point B
* Catchment 201A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[3], NHYD=["201A"], DT=[1]min, AREA=[5.06](ha),
                    XIMP=[0.01], TIMP=[0.24], DWF=[0](cms), LOSS=[2], CN=[62],
                    SLOPE=[4](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------|
*HALF of 10 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.021](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------|
* Discharges to Point B
* Catchment 201B (rear of lots)
CALIB NASHYD        ID=[3], NHYD=["201B"], DT=[1]min, AREA=[1.08](ha),
                    DWF=[0](cms),  CN/C=[68], IA=[7.3](mm),
                    N=[3], TP=[0.26]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.0045](cms), NINLET=[1],
```

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                    MAJID=[5], MajNHYD=["remainder"],
                    MINID=[6], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment 201C (rear of lots)
CALIB NASHYD        ID=[3], NHYD=["201C"], DT=[5]min, AREA=[1.98](ha),
                    DWF=[0](cms),  CN/C=[66], IA=[7.5](mm),
                    N=[3], TP=[0.22]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.006](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["remainder"],
                    MINID=[7], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment 201D (natural area, drains directly to existing outlet)
CALIB NASHYD        ID=[7], NHYD=["201D"], DT=[5]min, AREA=[5.54](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10.0](mm),
                    N=[3], TP=[0.36]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[8], NHYD=["B"], IDs to add=[1,2,4,5,6,7]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment 202A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["202A"], DT=[1]min, AREA=[3.05](ha),
                    XIMP=[0.01], TIMP=[0.249], DWF=[0](cms), LOSS=[2], CN=[51],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 11 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0225](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment 202B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202B"], DT=[5]min, AREA=[1.55](ha),
                    DWF=[0](cms),  CN/C=[41], IA=[9](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 2 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.003](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment 202C (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202C"], DT=[1]min, AREA=[1.34](ha),
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                    DWF=[0](cms),  CN/C=[47], IA=[7.7](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.006](cms), NINLET=[1],
                    MAJID=[5], MajNHYD=["remainder"],
                    MINID=[6], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment 202D (natural area, drains directly to existing outlet)
CALIB NASHYD        ID=[2], NHYD=["202D"], DT=[1]min, AREA=[1.96](ha),
                    DWF=[0](cms),  CN/C=[45], IA=[8.2](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 6 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.009](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["remainder"],
                    MINID=[7], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Total to Point C
ADD HYD             IDsum=[7], NHYD=["C"], IDs to add=[1,3,4,5,6]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment 203A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["203A"], DT=[1]min, AREA=[1.96](ha),
                    XIMP=[0.01], TIMP=[0.313], DWF=[0](cms), LOSS=[2], CN=[53],
                    SLOPE=[3](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 4 ROOFS & 4 FULL ROOFS will discharge to infiltration trench
*Asphalt from the ROW will discharge to an LID in the cul-de-sac (0.017cms)
COMPUTE DUALHYD     IDin=[2], CINLET=[0.035](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment 203B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["203B"], DT=[1]min, AREA=[0.52](ha),
                    DWF=[0](cms),  CN/C=[58], IA=[5.5](mm),
                    N=[3], TP=[0.14]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[4], NHYD=["D"], IDs to add=[1,3,4]
*%-----------------|-------------------------------------------------------------|
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*%-----------------|---------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* 10-year Storm - 3 hour
CHICAGO STORM       IUNITS=[2],  TD=[3](hrs), TPRAT=[0.33],  CSDT=[5](min),
                    ICASEcs=[2],
                    Enter ordinates of IDF curve below, at least seven points
                        TIME (min)    Intensity(mm/hr)
                          [   5   ]       [ 159.9  ]
                              10            115.4
                              15            103.7
                              30             73.4
                              60             48.3
                              120            28.0
                              360            11.0
                              720             6.0
                              1440            3.4
                                -1            -1
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.80](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.6](mm),
                    N=[3], TP=[0.12]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Total to Point A (from site)
ADD HYD             IDsum=[5], NHYD=["A"], IDs to add=[1,3]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment EXT-1
CALIB NASHYD        ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
                    N=[3], TP=[0.83]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD        ID=[2], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.08]hrs,
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                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[3], NHYD=["201A"], DT=[1]min, AREA=[5.06](ha),
                    XIMP=[0.01], TIMP=[0.24], DWF=[0](cms), LOSS=[2], CN=[62],
                    SLOPE=[4](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 10 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.021](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201B (rear of lots)
CALIB NASHYD        ID=[3], NHYD=["201B"], DT=[1]min, AREA=[1.08](ha),
                    DWF=[0](cms),  CN/C=[68], IA=[7.3](mm),
                    N=[3], TP=[0.26]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[5], MajNHYD=["remainder"],
                    MINID=[6], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201C (rear of lots)
CALIB NASHYD        ID=[3], NHYD=["201C"], DT=[5]min, AREA=[1.98](ha),
                    DWF=[0](cms),  CN/C=[66], IA=[7.5](mm),
                    N=[3], TP=[0.22]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.006](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["remainder"],
                    MINID=[7], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201D (natural area, drains directly to existing outlet)
CALIB NASHYD        ID=[7], NHYD=["201D"], DT=[5]min, AREA=[5.54](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10.0](mm),
                    N=[3], TP=[0.36]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[8], NHYD=["B"], IDs to add=[1,2,4,5,6,7]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["202A"], DT=[1]min, AREA=[3.05](ha),
                    XIMP=[0.01], TIMP=[0.249], DWF=[0](cms), LOSS=[2], CN=[51],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
```

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*%-----------------|---------------------------------------------------------|
*HALF of 11 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0225](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202B"], DT=[5]min, AREA=[1.55](ha),
                    DWF=[0](cms),  CN/C=[41], IA=[9](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 2 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.003](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202C (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202C"], DT=[1]min, AREA=[1.34](ha),
                    DWF=[0](cms),  CN/C=[47], IA=[7.7](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.006](cms), NINLET=[1],
                    MAJID=[5], MajNHYD=["remainder"],
                    MINID=[6], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202D (natural area, drains directly to existing outlet)
CALIB NASHYD        ID=[2], NHYD=["202D"], DT=[1]min, AREA=[1.96](ha),
                    DWF=[0](cms),  CN/C=[45], IA=[8.2](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 6 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.009](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["remainder"],
                    MINID=[7], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Total to Point C
ADD HYD             IDsum=[7], NHYD=["C"], IDs to add=[1,3,4,5,6]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point D
* Catchment 203A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["203A"], DT=[1]min, AREA=[1.96](ha),
                    XIMP=[0.01], TIMP=[0.313], DWF=[0](cms), LOSS=[2], CN=[53],
                    SLOPE=[3](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|---------------------------------------------------------|
```

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*HALF of 4 ROOFS & 4 FULL ROOFS will discharge to infiltration trench
*Asphalt from the ROW will discharge to an LID in the cul-de-sac (0.017cms)
COMPUTE DUALHYD     IDin=[2], CINLET=[0.035](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point D
* Catchment 203B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["203B"], DT=[1]min, AREA=[0.52](ha),
                    DWF=[0](cms),  CN/C=[58], IA=[5.5](mm),
                    N=[3], TP=[0.14]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[4], NHYD=["D"], IDs to add=[1,3,4]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* 25-year Storm - 3 hour
CHICAGO STORM       IUNITS=[2],  TD=[3](hrs), TPRAT=[0.33],  CSDT=[5](min),
                    ICASEcs=[2],
                    Enter ordinates of IDF curve below, at least seven points
                        TIME (min)    Intensity(mm/hr)
                          [   5   ]       [ 186.0  ]
                              10            136.2
                              15            124.0
                              30             89.5
                              60             59.7
                              120            34.3
                              360            13.3
                              720             7.1
                              1440            4.0
                                -1            -1
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.80](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.6](mm),
                    N=[3], TP=[0.12]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
```

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*%-----------------|---------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Total to Point A (from site)
ADD HYD             IDsum=[5], NHYD=["A"], IDs to add=[1,3]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment EXT-1
CALIB NASHYD        ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
                    N=[3], TP=[0.83]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD        ID=[2], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.08]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[3], NHYD=["201A"], DT=[1]min, AREA=[5.06](ha),
                    XIMP=[0.01], TIMP=[0.24], DWF=[0](cms), LOSS=[2], CN=[62],
                    SLOPE=[4](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 10 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.021](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201B (rear of lots)
CALIB NASHYD        ID=[3], NHYD=["201B"], DT=[1]min, AREA=[1.08](ha),
                    DWF=[0](cms),  CN/C=[68], IA=[7.3](mm),
                    N=[3], TP=[0.26]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[5], MajNHYD=["remainder"],
                    MINID=[6], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201C (rear of lots)
CALIB NASHYD        ID=[3], NHYD=["201C"], DT=[5]min, AREA=[1.98](ha),
                    DWF=[0](cms),  CN/C=[66], IA=[7.5](mm),
                    N=[3], TP=[0.22]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.006](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["remainder"],
                    MINID=[7], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
```

```
* Discharges to Point B
* Catchment 201D (natural area, drains directly to existing outlet)
CALIB NASHYD        ID=[7], NHYD=["201D"], DT=[5]min, AREA=[5.54](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10.0](mm),
                    N=[3], TP=[0.36]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[8], NHYD=["B"], IDs to add=[1,2,4,5,6,7]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment 202A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["202A"], DT=[1]min, AREA=[3.05](ha),
                    XIMP=[0.01], TIMP=[0.249], DWF=[0](cms), LOSS=[2], CN=[51],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 11 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0225](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment 202B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202B"], DT=[5]min, AREA=[1.55](ha),
                    DWF=[0](cms),  CN/C=[41], IA=[9](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 2 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.003](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment 202C (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202C"], DT=[1]min, AREA=[1.34](ha),
                    DWF=[0](cms),  CN/C=[47], IA=[7.7](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.006](cms), NINLET=[1],
                    MAJID=[5], MajNHYD=["remainder"],
                    MINID=[6], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment 202D (natural area, drains directly to existing outlet)
CALIB NASHYD        ID=[2], NHYD=["202D"], DT=[1]min, AREA=[1.96](ha),
                    DWF=[0](cms),  CN/C=[45], IA=[8.2](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
```

```
*HALF of 6 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.009](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["remainder"],
                    MINID=[7], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Total to Point C
ADD HYD             IDsum=[7], NHYD=["C"], IDs to add=[1,3,4,5,6]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point D
* Catchment 203A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["203A"], DT=[1]min, AREA=[1.96](ha),
                    XIMP=[0.01], TIMP=[0.313], DWF=[0](cms), LOSS=[2], CN=[53],
                    SLOPE=[3](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 4 ROOFS & 4 FULL ROOFS will discharge to infiltration trench
*Asphalt from the ROW will discharge to an LID in the cul-de-sac (0.017cms)
COMPUTE DUALHYD     IDin=[2], CINLET=[0.035](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point D
* Catchment 203B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["203B"], DT=[1]min, AREA=[0.52](ha),
                    DWF=[0](cms),  CN/C=[58], IA=[5.5](mm),
                    N=[3], TP=[0.14]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[4], NHYD=["D"], IDs to add=[1,3,4]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* 50-year Storm - 3 hour
CHICAGO STORM       IUNITS=[2],  TD=[3](hrs), TPRAT=[0.33],  CSDT=[5](min),
                    ICASEcs=[2],
                    Enter ordinates of IDF curve below, at least seven points
                        TIME (min)    Intensity(mm/hr)
                          [   5   ]       [ 205.3  ]
                              10            151.6
```

```
                                Post.dat
                            15            139.0
                            30            101.4
                            60             68.2
                            120            39.0
                            360            15.0
                            720             7.9
                            1440            4.4
                              -1             -1
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.80](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.6](mm),
                    N=[3], TP=[0.12]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Total to Point A (from site)
ADD HYD             IDsum=[5], NHYD=["A"], IDs to add=[1,3]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment EXT-1
CALIB NASHYD        ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
                    N=[3], TP=[0.83]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD        ID=[2], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.08]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment 201A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[3], NHYD=["201A"], DT=[1]min, AREA=[5.06](ha),
                    XIMP=[0.01], TIMP=[0.24], DWF=[0](cms), LOSS=[2], CN=[62],
                    SLOPE=[4](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 10 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.021](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment 201B (rear of lots)
CALIB NASHYD        ID=[3], NHYD=["201B"], DT=[1]min, AREA=[1.08](ha),
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                    DWF=[0](cms),  CN/C=[68], IA=[7.3](mm),
                    N=[3], TP=[0.26]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[5], MajNHYD=["remainder"],
                    MINID=[6], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment 201C (rear of lots)
CALIB NASHYD        ID=[3], NHYD=["201C"], DT=[5]min, AREA=[1.98](ha),
                    DWF=[0](cms),  CN/C=[66], IA=[7.5](mm),
                    N=[3], TP=[0.22]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.006](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["remainder"],
                    MINID=[7], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point B
* Catchment 201D (natural area, drains directly to existing outlet)
CALIB NASHYD        ID=[7], NHYD=["201D"], DT=[5]min, AREA=[5.54](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10.0](mm),
                    N=[3], TP=[0.36]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[8], NHYD=["B"], IDs to add=[1,2,4,5,6,7]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment 202A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["202A"], DT=[1]min, AREA=[3.05](ha),
                    XIMP=[0.01], TIMP=[0.249], DWF=[0](cms), LOSS=[2], CN=[51],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 11 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0225](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment 202B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202B"], DT=[5]min, AREA=[1.55](ha),
                    DWF=[0](cms),  CN/C=[41], IA=[9](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 2 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.003](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
```

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                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment 202C (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202C"], DT=[1]min, AREA=[1.34](ha),
                    DWF=[0](cms),  CN/C=[47], IA=[7.7](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.006](cms), NINLET=[1],
                    MAJID=[5], MajNHYD=["remainder"],
                    MINID=[6], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point C
* Catchment 202D (natural area, drains directly to existing outlet)
CALIB NASHYD        ID=[2], NHYD=["202D"], DT=[1]min, AREA=[1.96](ha),
                    DWF=[0](cms),  CN/C=[45], IA=[8.2](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 6 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.009](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["remainder"],
                    MINID=[7], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Total to Point C
ADD HYD             IDsum=[7], NHYD=["C"], IDs to add=[1,3,4,5,6]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment 203A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["203A"], DT=[1]min, AREA=[1.96](ha),
                    XIMP=[0.01], TIMP=[0.313], DWF=[0](cms), LOSS=[2], CN=[53],
                    SLOPE=[3](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 4 ROOFS & 4 FULL ROOFS will discharge to infiltration trench
*Asphalt from the ROW will discharge to an LID in the cul-de-sac (0.017cms)
COMPUTE DUALHYD     IDin=[2], CINLET=[0.035](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment 203B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["203B"], DT=[1]min, AREA=[0.52](ha),
                    DWF=[0](cms),  CN/C=[58], IA=[5.5](mm),
                    N=[3], TP=[0.14]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
```

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                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%------------------|---------------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[4], NHYD=["D"], IDs to add=[1,3,4]
*%------------------|---------------------------------------------------------------|
*%------------------|---------------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|---------------------------------------------------------------|
*%------------------|---------------------------------------------------------------|
* 100-year Storm - 3 hour
CHICAGO STORM       IUNITS=[2],  TD=[3](hrs), TPRAT=[0.33],  CSDT=[5](min),
                    ICASEcs=[2],
                    Enter ordinates of IDF curve below, at least seven points
                        TIME (min)    Intensity(mm/hr)
                          [   5   ]       [ 224.5  ]
                              10            166.9
                              15            153.9
                              30            113.3
                              60             76.6
                              120            43.7
                              360            16.6
                              720             8.8
                              1440            4.9
                                -1            -1
*%------------------|---------------------------------------------------------------|
*%------------------|---------------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|---------------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.80](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.6](mm),
                    N=[3], TP=[0.12]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%------------------|---------------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%------------------|---------------------------------------------------------------|
* Total to Point A (from site)
ADD HYD             IDsum=[5], NHYD=["A"], IDs to add=[1,3]
*%------------------|---------------------------------------------------------------|
*%------------------|---------------------------------------------------------------|
* Discharges to Point B
* Catchment EXT-1
CALIB NASHYD        ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                    DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
                    N=[3], TP=[0.83]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
```

```
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD        ID=[2], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.08]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[3], NHYD=["201A"], DT=[1]min, AREA=[5.06](ha),
                    XIMP=[0.01], TIMP=[0.24], DWF=[0](cms), LOSS=[2], CN=[62],
                    SLOPE=[4](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 10 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.021](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201B (rear of lots)
CALIB NASHYD        ID=[3], NHYD=["201B"], DT=[1]min, AREA=[1.08](ha),
                    DWF=[0](cms),  CN/C=[68], IA=[7.3](mm),
                    N=[3], TP=[0.26]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[5], MajNHYD=["remainder"],
                    MINID=[6], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201C (rear of lots)
CALIB NASHYD        ID=[3], NHYD=["201C"], DT=[5]min, AREA=[1.98](ha),
                    DWF=[0](cms),  CN/C=[66], IA=[7.5](mm),
                    N=[3], TP=[0.22]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[3], CINLET=[0.006](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["remainder"],
                    MINID=[7], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201D (natural area, drains directly to existing outlet)
CALIB NASHYD        ID=[7], NHYD=["201D"], DT=[5]min, AREA=[5.54](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10.0](mm),
                    N=[3], TP=[0.36]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[8], NHYD=["B"], IDs to add=[1,2,4,5,6,7]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
```

```
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["202A"], DT=[1]min, AREA=[3.05](ha),
                    XIMP=[0.01], TIMP=[0.249], DWF=[0](cms), LOSS=[2], CN=[51],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 11 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0225](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202B"], DT=[5]min, AREA=[1.55](ha),
                    DWF=[0](cms),  CN/C=[41], IA=[9](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 2 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.003](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202C (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202C"], DT=[1]min, AREA=[1.34](ha),
                    DWF=[0](cms),  CN/C=[47], IA=[7.7](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.006](cms), NINLET=[1],
                    MAJID=[5], MajNHYD=["remainder"],
                    MINID=[6], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202D (natural area, drains directly to existing outlet)
CALIB NASHYD        ID=[2], NHYD=["202D"], DT=[1]min, AREA=[1.96](ha),
                    DWF=[0](cms),  CN/C=[45], IA=[8.2](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 6 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.009](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["remainder"],
                    MINID=[7], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Total to Point C
ADD HYD             IDsum=[7], NHYD=["C"], IDs to add=[1,3,4,5,6]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
```

```
* Discharges to Point D
* Catchment 203A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["203A"], DT=[1]min, AREA=[1.96](ha),
                    XIMP=[0.01], TIMP=[0.313], DWF=[0](cms), LOSS=[2], CN=[53],
                    SLOPE=[3](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------|
*HALF of 4 ROOFS & 4 FULL ROOFS will discharge to infiltration trench
*Asphalt from the ROW will discharge to an LID in the cul-de-sac (0.017cms)
COMPUTE DUALHYD     IDin=[2], CINLET=[0.035](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------|
* Discharges to Point D
* Catchment 203B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["203B"], DT=[1]min, AREA=[0.52](ha),
                    DWF=[0](cms),  CN/C=[58], IA=[5.5](mm),
                    N=[3], TP=[0.14]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[4], NHYD=["D"], IDs to add=[1,3,4]
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
*REGIONAL STORM HURRICANE HAZEL (12-HOUR WITH ANTECEDENT CONDITIONS)
*
READ STORM          STORM_FILENAME=["Hzl12h15.STM"]
*%-----------------|-------------------------------------------------------|
*%-----------------|-------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-1
CALIB NASHYD        ID=[1], NHYD=["UNC-1"], DT=[1]min, AREA=[0.4](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
* Discharges to Point A
* Catchment UNC-2
CALIB NASHYD        ID=[2], NHYD=["UNC-2"], DT=[1]min, AREA=[0.80](ha),
                    DWF=[0](cms),  CN/C=[69], IA=[6.6](mm),
                    N=[3], TP=[0.12]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
```

```
*%-----------------|---------------------------------------------------------|
* Total to Point A (from site)
ADD HYD            IDsum=[5], NHYD=["A"], IDs to add=[1,3]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment EXT-1
CALIB NASHYD       ID=[1], NHYD=["EXT-1"], DT=[5]min, AREA=[99.4](ha),
                   DWF=[0](cms),  CN/C=[53], IA=[8.5](mm),
                   N=[3], TP=[0.83]hrs,
                   RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment UNC-3
CALIB NASHYD       ID=[2], NHYD=["UNC-3"], DT=[1]min, AREA=[0.27](ha),
                   DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                   N=[3], TP=[0.08]hrs,
                   RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD    ID=[3], NHYD=["201A"], DT=[1]min, AREA=[5.06](ha),
                   XIMP=[0.01], TIMP=[0.24], DWF=[0](cms), LOSS=[2], CN=[62],
                   SLOPE=[4](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 10 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD    IDin=[3], CINLET=[0.021](cms), NINLET=[1],
                   MAJID=[4], MajNHYD=["remainder"],
                   MINID=[5], MinNHYD=["LID"],
                   TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201B (rear of lots)
CALIB NASHYD       ID=[3], NHYD=["201B"], DT=[1]min, AREA=[1.08](ha),
                   DWF=[0](cms),  CN/C=[68], IA=[7.3](mm),
                   N=[3], TP=[0.26]hrs,
                   RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD    IDin=[3], CINLET=[0.0045](cms), NINLET=[1],
                   MAJID=[5], MajNHYD=["remainder"],
                   MINID=[6], MinNHYD=["LID"],
                   TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201C (rear of lots)
CALIB NASHYD       ID=[3], NHYD=["201C"], DT=[5]min, AREA=[1.98](ha),
                   DWF=[0](cms),  CN/C=[66], IA=[7.5](mm),
                   N=[3], TP=[0.22]hrs,
                   RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD    IDin=[3], CINLET=[0.006](cms), NINLET=[1],
                   MAJID=[6], MajNHYD=["remainder"],
                   MINID=[7], MinNHYD=["LID"],
                   TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point B
* Catchment 201D (natural area, drains directly to existing outlet)
CALIB NASHYD       ID=[7], NHYD=["201D"], DT=[5]min, AREA=[5.54](ha),
                   DWF=[0](cms),  CN/C=[60], IA=[10.0](mm),
                   N=[3], TP=[0.36]hrs,
                   RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
```

```
*%-----------------|---------------------------------------------------------|
* Total to Point B
ADD HYD             IDsum=[8], NHYD=["B"], IDs to add=[1,2,4,5,6,7]
*%-----------------|---------------------------------------------------------|
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment EXT-2
CALIB NASHYD        ID=[1], NHYD=["EXT-2"], DT=[5]min, AREA=[33.1](ha),
                    DWF=[0](cms),  CN/C=[51], IA=[7](mm),
                    N=[3], TP=[0.48]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["202A"], DT=[1]min, AREA=[3.05](ha),
                    XIMP=[0.01], TIMP=[0.249], DWF=[0](cms), LOSS=[2], CN=[51],
                    SLOPE=[2](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 11 ROOFS & 2 FULL ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0225](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202B"], DT=[5]min, AREA=[1.55](ha),
                    DWF=[0](cms),  CN/C=[41], IA=[9](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 2 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.003](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202C (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["202C"], DT=[1]min, AREA=[1.34](ha),
                    DWF=[0](cms),  CN/C=[47], IA=[7.7](mm),
                    N=[3], TP=[0.21]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 4 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.006](cms), NINLET=[1],
                    MAJID=[5], MajNHYD=["remainder"],
                    MINID=[6], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
* Discharges to Point C
* Catchment 202D (natural area, drains directly to existing outlet)
CALIB NASHYD        ID=[2], NHYD=["202D"], DT=[1]min, AREA=[1.96](ha),
                    DWF=[0](cms),  CN/C=[45], IA=[8.2](mm),
                    N=[3], TP=[0.15]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|---------------------------------------------------------|
*HALF of 6 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.009](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["remainder"],
                    MINID=[7], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|---------------------------------------------------------|
```

```
* Total to Point C
ADD HYD             IDsum=[7], NHYD=["C"], IDs to add=[1,3,4,5,6]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment EXT-3 (all forest)
CALIB NASHYD        ID=[1], NHYD=["EXT-3"], DT=[1]min, AREA=[0.53](ha),
                    DWF=[0](cms),  CN/C=[36], IA=[10](mm),
                    N=[3], TP=[0.11]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment 203A (ROW & portion of lots that drain to ROW)
DESIGN STANDHYD     ID=[2], NHYD=["203A"], DT=[1]min, AREA=[1.96](ha),
                    XIMP=[0.01], TIMP=[0.313], DWF=[0](cms), LOSS=[2], CN=[53],
                    SLOPE=[3](%), RAINFALL=[ , , , , ](mm/hr), END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 4 ROOFS & 4 FULL ROOFS will discharge to infiltration trench
*Asphalt from the ROW will discharge to an LID in the cul-de-sac (0.017cms)
COMPUTE DUALHYD     IDin=[2], CINLET=[0.035](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["remainder"],
                    MINID=[4], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Discharges to Point D
* Catchment 203B (rear of lots)
CALIB NASHYD        ID=[2], NHYD=["203B"], DT=[1]min, AREA=[0.52](ha),
                    DWF=[0](cms),  CN/C=[58], IA=[5.5](mm),
                    N=[3], TP=[0.14]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*HALF of 3 ROOFS will discharge to infiltration trench
COMPUTE DUALHYD     IDin=[2], CINLET=[0.0045](cms), NINLET=[1],
                    MAJID=[4], MajNHYD=["remainder"],
                    MINID=[5], MinNHYD=["LID"],
                    TMJSTO=[   ](cu-m)
*%-----------------|-------------------------------------------------------------|
* Total to Point D
ADD HYD             IDsum=[4], NHYD=["D"], IDs to add=[1,3,4]
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
* Other (this catchment remains the same in pre and post development)
* Discharges east of site
* Catchment UNC-4
CALIB NASHYD        ID=[1], NHYD=["UNC-4"], DT=[1]min, AREA=[0.14](ha),
                    DWF=[0](cms),  CN/C=[60], IA=[10](mm),
                    N=[3], TP=[0.03]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
*%-----------------|-------------------------------------------------------------|
FINISH
```

```
  SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
  S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
  SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
      S   W W   M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
  SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9   =========
                                                       9   9  9   9   # 3877524
       StormWater Management HYdrologic Model           999    999    =========

 ********************************************************************************
 ***************************** SWMHYMO Ver/4.05  ********************************
 *********  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: R.J. Burnside & Associates Ltd                +++++++++
 +++++++++                Brampton              SERIAL#:3877524        +++++++++
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ********************************************************************************
 *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
 *********           Maximum value for ID numbers  :     10            *********
 *********           Max. number of rainfall points: 105408            *********
 *********           Max. number of flow points    : 105408            *********
 ********************************************************************************

 ***** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) *****
 *****-------------------------------------------------------------------*****
 *****    ID:  Hydrograph IDentification numbers, (1-10).                *****
 *****  NHYD:  Hydrograph reference numbers, (6 digits or characters).   *****
 *****  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.). *****
 ***** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).   *****
 ***** TpeakDate_hh:mm is the date and time of the peak flow.            *****
 *****  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).      *****
 *****  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).      *****
 *****     *:  see WARNING or NOTE message printed at end of run.        *****
 *****    **:  see  ERROR  message printed at end of run.                *****
 ********************************************************************************
 ********************************************************************************

::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

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

 **********************   S U M M A R Y   O U T P U T   **********************
 ********************************************************************************
 *         DATE: 2018-12-03     TIME: 22:33:16     RUN COUNTER: 001711          *
 ********************************************************************************
 * Input   filename: C:\SWMHYMO\8THLIN~1\181203\Post.dat                        *
 * Output  filename: C:\SWMHYMO\8THLIN~1\181203\Post.out                        *
 * Summary filename: C:\SWMHYMO\8THLIN~1\181203\Post.sum                        *
 * User comments:                                                               *
 * 1:_____________________________________________________________________________*
 * 2:_____________________________________________________________________________*
 * 3:_____________________________________________________________________________*
```

```
#*******************************************************************************
#  Project Name: [ERIN 8TH LINE]    Project Number: [300039324]
#  Date        : 29-NOV-2018
#  Modeller    : [A.FRY, J.Scott]
#  Company     : R.J. Burnside & Associates Ltd
#  License #   :  3877524
#*******************************************************************************
 RUN:COMMAND#

001:0001-------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   1 ]
# *********************************************************************
# ERIN 8TH LINE HYDROLOGY ANALYSIS - POST DEVELOPMENT CONDITIONS
#
# Model is based on delineations on FIG XX
# There are 4 points of discharge, the model is set up to show the total flow
# from the site to these 4 points (A, B, C & D)
#
# Flow to infiltrated by LIDs based on 25mm model
# (25mm discharge off 1 FULL ROOF = 0.003cms)
#
# Storm files are based on Enviro. Canada data from Fergus Shand Dam
# 3hr Chicago distribution as per Town of Erin standards
# *********************************************************************

001:0002-------------------------------------------------------------------------
     CHICAGO STORM
      [SDT= 5.00:SDUR=   3.00:PTOT=  33.49]
      {A/B/C= 719.435/   6.193/    .797: R=.9999}

001:0003---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1           .40     .003 No_date    1:16    2.86 .085
      [CN= 60.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0004---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2           .80     .015 No_date    1:11    5.13 .153
      [CN= 69.0: N= 3.00]
      [Tp=  .12:DT= 1.00]

001:0005---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:UNC-2           .80     .015 No_date    1:11    5.13  n/a
        Major System /  03:remainder       .27     .011 No_date    1:11    5.13  n/a
        Minor System \  04:LID             .53     .004 No_date    1:01    5.13  n/a

001:0006---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:UNC-1           .40     .003 No_date    1:16    2.86  n/a
                      +  03:remainder       .27     .011 No_date    1:11    5.13  n/a
      [DT= 1.00]  SUM=  05:A               .67     .014 No_date    1:12    3.77  n/a

001:0007---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-1         99.40     .303 No_date    2:15    2.50 .075
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0008---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
     CALIB NASHYD       02:UNC-3           .27     .003 No_date    1:09    2.86 .085
      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]

001:0009--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    03:201A           5.06     .102 No_date    1:16    7.14 .213
      [XIMP=.01:TIMP=.24]
      [SLP=4.00:DT= 1.00]
      [LOSS= 2 :CN= 62.0]

001:0010--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201A           5.06     .102 No_date    1:16    7.14  n/a
        Major System /  04:remainder      2.59     .081 No_date    1:16    7.14  n/a
        Minor System \  05:LID            2.47     .021 No_date    0:58    7.14  n/a

001:0011--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201B           1.08     .012 No_date    1:25    4.71 .141
      [CN= 68.0: N= 3.00]
      [Tp=  .26:DT= 1.00]

001:0012--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201B           1.08     .012 No_date    1:25    4.71  n/a
        Major System /  05:remainder       .38     .008 No_date    1:25    4.71  n/a
        Minor System \  06:LID             .70     .004 No_date    1:07    4.71  n/a

001:0013--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201C           1.98     .022 No_date    1:20    4.31 .129
      [CN= 66.0: N= 3.00]
      [Tp=  .22:DT= 5.00]

001:0014--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201C           1.98     .022 No_date    1:20    4.31  n/a
        Major System /  06:remainder       .89     .016 No_date    1:20    4.31  n/a
        Minor System \  07:LID            1.09     .006 No_date    1:05    4.31  n/a

001:0015--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:201D           5.54     .030 No_date    1:35    2.86 .085
      [CN= 60.0: N= 3.00]
      [Tp=  .36:DT= 5.00]

001:0016--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1         99.40     .303 No_date    2:15    2.50  n/a
                      +  02:UNC-3           .27     .003 No_date    1:09    2.86  n/a
                      +  04:remainder      2.59     .081 No_date    1:16    7.14  n/a
                      +  05:remainder       .38     .008 No_date    1:25    4.71  n/a
                      +  06:remainder       .89     .016 No_date    1:20    4.31  n/a
                      +  07:201D           5.54     .030 No_date    1:35    2.86  n/a
      [DT= 1.00]  SUM=  08:B            109.06     .335 No_date    2:05    2.65  n/a

001:0017--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-2         33.10     .147 No_date    1:45    2.59 .077
      [CN= 51.0: N= 3.00]
      [Tp=  .48:DT= 5.00]

001:0018--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:202A           3.05     .034 No_date    1:24    5.09 .152
      [XIMP=.01:TIMP=.25]
      [SLP=2.00:DT= 1.00]
      [LOSS= 2 :CN= 51.0]

001:0019--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202A           3.05     .034 No_date    1:24    5.09  n/a
        Major System /  03:remainder       .33     .012 No_date    1:24    5.09  n/a
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       Minor System \  04:LID            2.72     .023 No_date    1:12    5.09  n/a

001:0020--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202B           1.55     .006 No_date    1:20    1.54 .046
      [CN= 41.0: N= 3.00]
      [Tp=  .21:DT= 5.00]

001:0021--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202B           1.55     .006 No_date    1:20    1.54  n/a
        Major System /  04:remainder       .32     .003 No_date    1:20    1.54  n/a
        Minor System \  05:LID            1.23     .003 No_date    1:10    1.54  n/a

001:0022--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202C           1.34     .008 No_date    1:21    2.13 .064
      [CN= 47.0: N= 3.00]
      [Tp=  .21:DT= 1.00]

001:0023--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202C           1.34     .008 No_date    1:21    2.13  n/a
        Major System /  05:remainder       .06     .002 No_date    1:21    2.13  n/a
        Minor System \  06:LID            1.28     .006 No_date    1:12    2.13  n/a

001:0024--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202D           1.96     .011 No_date    1:15    1.90 .057
      [CN= 45.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0025--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202D           1.96     .011 No_date    1:15    1.90  n/a
        Major System /  06:remainder       .08     .002 No_date    1:15    1.90  n/a
        Minor System \  07:LID            1.88     .009 No_date    1:09    1.90  n/a

001:0026--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-2         33.10     .147 No_date    1:45    2.59  n/a
                      +  03:remainder       .33     .012 No_date    1:24    5.09  n/a
                      +  04:remainder       .32     .003 No_date    1:20    1.54  n/a
                      +  05:remainder       .06     .002 No_date    1:21    2.13  n/a
                      +  06:remainder       .08     .002 No_date    1:15    1.90  n/a
      [DT= 1.00]  SUM=  07:C             33.89     .153 No_date    1:40    2.61  n/a

001:0027--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-3           .53     .002 No_date    1:12    1.16 .035
      [CN= 36.0: N= 3.00]
      [Tp=  .11:DT= 1.00]

001:0028--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:203A           1.96     .030 No_date    1:18    5.85 .175
      [XIMP=.01:TIMP=.31]
      [SLP=3.00:DT= 1.00]
      [LOSS= 2 :CN= 53.0]

001:0029--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203A           1.96     .030 No_date    1:18    5.85  n/a
        Major System /  03:remainder       .00     .000 No_date    0:00     .00  n/a
        Minor System \  04:LID            1.96     .030 No_date    1:18    5.85  n/a

001:0030--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:203B           .52     .007 No_date    1:12    3.70 .110
      [CN= 58.0: N= 3.00]
      [Tp=  .14:DT= 1.00]

001:0031--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203B           .52     .007 No_date    1:12    3.70  n/a
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       Major System /  04:remainder       .05     .002 No_date    1:12    3.70  n/a
       Minor System \  05:LID             .47     .004 No_date    1:05    3.70  n/a

001:0032---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:EXT-3           .53     .002 No_date    1:12    1.16  n/a
                   +   03:remainder       .00     .000 No_date    0:00     .00  n/a
                   +   04:D               .05     .002 No_date    1:12    3.70  n/a
      [DT= 1.00]  SUM=  04:D              1.06     .004 No_date    1:12    1.16  n/a

001:0033---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4           .14     .002 No_date    1:05    2.86 .085
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0034--------------------------------------------------------------------------------
     CHICAGO STORM
      [SDT= 5.00:SDUR=   3.00:PTOT=  49.22]
      {A/B/C=1525.827/  12.117/    .862: R=.9997}

001:0035---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1           .40     .010 No_date    1:15    7.38 .150
      [CN= 60.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0036---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2           .80     .036 No_date    1:11   11.59 .235
      [CN= 69.0: N= 3.00]
      [Tp=  .12:DT= 1.00]

001:0037---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:UNC-2           .80     .036 No_date    1:11   11.59  n/a
        Major System /  03:remainder       .50     .032 No_date    1:11   11.59  n/a
        Minor System \  04:LID             .30     .004 No_date    0:58   11.59  n/a

001:0038---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:UNC-1           .40     .010 No_date    1:15    7.38  n/a
                   +   03:remainder       .50     .032 No_date    1:11   11.59  n/a
      [DT= 1.00]  SUM=  05:A               .90     .041 No_date    1:12    9.71  n/a

001:0039---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-1         99.40     .803 No_date    2:10    6.23 .127
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0040---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-3           .27     .008 No_date    1:08    7.38 .150
      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]

001:0041---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    03:201A           5.06     .234 No_date    1:13   14.13 .287
      [XIMP=.01:TIMP=.24]
      [SLP=4.00:DT= 1.00]
      [LOSS= 2 :CN= 62.0]

001:0042---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201A           5.06     .234 No_date    1:13   14.13  n/a
        Major System /  04:remainder      3.71     .213 No_date    1:13   14.13  n/a
        Minor System \  05:LID            1.35     .021 No_date    0:54   14.13  n/a

001:0043---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201B           1.08     .032 No_date    1:24   10.88 .221
      [CN= 68.0: N= 3.00]
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      [Tp=  .26:DT= 1.00]

001:0044--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201B           1.08     .032 No_date    1:24   10.88  n/a
        Major System /  05:remainder       .72     .027 No_date    1:24   10.88  n/a
        Minor System \  06:LID             .36     .004 No_date    1:02   10.88  n/a

001:0045--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201C           1.98     .058 No_date    1:20   10.09 .205
      [CN= 66.0: N= 3.00]
      [Tp=  .22:DT= 5.00]

001:0046--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201C           1.98     .058 No_date    1:20   10.09  n/a
        Major System /  06:remainder      1.46     .052 No_date    1:20   10.09  n/a
        Minor System \  07:LID             .52     .006 No_date    1:00   10.09  n/a

001:0047--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:201D           5.54     .087 No_date    1:35    7.38 .150
      [CN= 60.0: N= 3.00]
      [Tp=  .36:DT= 5.00]

001:0048--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1         99.40     .803 No_date    2:10    6.23  n/a
                     +  02:UNC-3           .27     .008 No_date    1:08    7.38  n/a
                     +  04:remainder      3.71     .213 No_date    1:13   14.13  n/a
                     +  05:remainder       .72     .027 No_date    1:24   10.88  n/a
                     +  06:remainder      1.46     .052 No_date    1:20   10.09  n/a
                     +  07:201D           5.54     .087 No_date    1:35    7.38  n/a
      [DT= 1.00]  SUM=  08:B            111.10     .911 No_date    2:00    6.64  n/a

001:0049--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-2         33.10     .380 No_date    1:40    6.23 .127
      [CN= 51.0: N= 3.00]
      [Tp=  .48:DT= 5.00]

001:0050--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:202A           3.05     .085 No_date    1:19   10.30 .209
      [XIMP=.01:TIMP=.25]
      [SLP=2.00:DT= 1.00]
      [LOSS= 2 :CN= 51.0]

001:0051--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202A           3.05     .085 No_date    1:19   10.30  n/a
        Major System /  03:remainder      1.37     .063 No_date    1:19   10.30  n/a
        Minor System \  04:LID            1.68     .023 No_date    1:00   10.30  n/a

001:0052--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202B           1.55     .017 No_date    1:20    3.99 .081
      [CN= 41.0: N= 3.00]
      [Tp=  .21:DT= 5.00]

001:0053--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202B           1.55     .017 No_date    1:20    3.99  n/a
        Major System /  04:remainder       .93     .014 No_date    1:20    3.99  n/a
        Minor System \  05:LID             .62     .003 No_date    1:00    3.99  n/a

001:0054--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202C           1.34     .020 No_date    1:20    5.26 .107
      [CN= 47.0: N= 3.00]
      [Tp=  .21:DT= 1.00]

001:0055--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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     COMPUTE DUALHYD    02:202C          1.34     .020 No_date    1:20    5.26  n/a
        Major System /  05:remainder       .55     .014 No_date    1:20    5.26  n/a
        Minor System \  06:LID             .79     .006 No_date    1:04    5.26  n/a

001:0056--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202D          1.96     .031 No_date    1:15    4.79 .097
      [CN= 45.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0057--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202D          1.96     .031 No_date    1:15    4.79  n/a
        Major System /  06:remainder       .76     .022 No_date    1:15    4.79  n/a
        Minor System \  07:LID            1.20     .009 No_date    1:02    4.79  n/a

001:0058--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-2        33.10     .380 No_date    1:40    6.23  n/a
                      +  03:remainder     1.37     .063 No_date    1:19   10.30  n/a
                      +  04:remainder      .93     .014 No_date    1:20    3.99  n/a
                      +  05:remainder      .55     .014 No_date    1:20    5.26  n/a
                      +  06:remainder      .76     .022 No_date    1:15    4.79  n/a
      [DT= 1.00]  SUM=  07:C            36.71     .442 No_date    1:35    6.28  n/a

001:0059--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-3          .53     .006 No_date    1:12    3.13 .064
      [CN= 36.0: N= 3.00]
      [Tp=  .11:DT= 1.00]

001:0060--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:203A          1.96     .071 No_date    1:15   11.72 .238
      [XIMP=.01:TIMP=.31]
      [SLP=3.00:DT= 1.00]
      [LOSS= 2 :CN= 53.0]

001:0061--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203A          1.96     .071 No_date    1:15   11.72  n/a
        Major System /  03:remainder       .41     .036 No_date    1:15   11.72  n/a
        Minor System \  04:LID            1.55     .035 No_date    1:03   11.72  n/a

001:0062--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:203B           .52     .016 No_date    1:13    8.40 .171
      [CN= 58.0: N= 3.00]
      [Tp=  .14:DT= 1.00]

001:0063--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203B           .52     .016 No_date    1:13    8.40  n/a
        Major System /  04:remainder       .20     .011 No_date    1:13    8.40  n/a
        Minor System \  05:LID             .32     .004 No_date    1:01    8.40  n/a

001:0064--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-3          .53     .006 No_date    1:12    3.13  n/a
                      +  03:remainder       .41     .036 No_date    1:15   11.72  n/a
                      +  04:D               .20     .011 No_date    1:13    8.40  n/a
      [DT= 1.00]  SUM=  04:D              1.88     .084 No_date    1:15    6.89  n/a

001:0065--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4          .14     .005 No_date    1:01    7.38 .150
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0066--------------------------------------------------------------------------
     CHICAGO STORM
      [SDT= 5.00:SDUR=   3.00:PTOT=  59.85]
      {A/B/C=2179.495/  15.119/    .890: R=.9997}
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001:0067---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1            .40     .015 No_date    1:15   11.34 .189
      [CN= 60.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0068---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2            .80     .053 No_date    1:11   16.94 .283
      [CN= 69.0: N= 3.00]
      [Tp=  .12:DT= 1.00]

001:0069---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:UNC-2            .80     .053 No_date    1:11   16.94  n/a
        Major System /  03:remainder        .58     .049 No_date    1:11   16.94  n/a
        Minor System \  04:LID              .22     .004 No_date    0:56   16.94  n/a

001:0070---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:UNC-1            .40     .015 No_date    1:15   11.34  n/a
                      +  03:remainder        .58     .049 No_date    1:11   16.94  n/a
      [DT= 1.00]  SUM=  05:A                .98     .064 No_date    1:12   14.66  n/a

001:0071---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-1          99.40    1.252 No_date    2:10    9.53 .159
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0072---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-3            .27     .013 No_date    1:08   11.34 .189
      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]

001:0073---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    03:201A            5.06     .345 No_date    1:12   19.73 .330
      [XIMP=.01:TIMP=.24]
      [SLP=4.00:DT= 1.00]
      [LOSS= 2 :CN= 62.0]

001:0074---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201A            5.06     .345 No_date    1:12   19.73  n/a
        Major System /  04:remainder       4.06     .324 No_date    1:12   19.73  n/a
        Minor System \  05:LID             1.00     .021 No_date    0:51   19.73  n/a

001:0075---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201B            1.08     .048 No_date    1:24   16.05 .268
      [CN= 68.0: N= 3.00]
      [Tp=  .26:DT= 1.00]

001:0076---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201B            1.08     .048 No_date    1:24   16.05  n/a
        Major System /  05:remainder        .83     .043 No_date    1:24   16.05  n/a
        Minor System \  06:LID              .25     .004 No_date    1:00   16.05  n/a

001:0077---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201C            1.98     .087 No_date    1:20   14.96 .250
      [CN= 66.0: N= 3.00]
      [Tp=  .22:DT= 5.00]

001:0078---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201C            1.98     .087 No_date    1:20   14.96  n/a
        Major System /  06:remainder       1.62     .081 No_date    1:20   14.96  n/a
        Minor System \  07:LID              .36     .006 No_date    1:00   14.96  n/a

001:0079---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
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     CALIB NASHYD       07:201D           5.54     .139 No_date    1:30   11.34 .189
      [CN= 60.0: N= 3.00]
      [Tp=  .36:DT= 5.00]

001:0080---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1         99.40    1.252 No_date    2:10    9.53  n/a
                      +  02:UNC-3           .27     .013 No_date    1:08   11.34  n/a
                      +  04:remainder      4.06     .324 No_date    1:12   19.73  n/a
                      +  05:remainder       .83     .043 No_date    1:24   16.05  n/a
                      +  06:remainder      1.62     .081 No_date    1:20   14.96  n/a
                      +  07:201D           5.54     .139 No_date    1:30   11.34  n/a
      [DT= 1.00]  SUM=  08:B            111.72    1.423 No_date    2:00   10.12  n/a

001:0081---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-2         33.10     .587 No_date    1:40    9.41 .157
      [CN= 51.0: N= 3.00]
      [Tp=  .48:DT= 5.00]

001:0082---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:202A           3.05     .130 No_date    1:16   14.59 .244
      [XIMP=.01:TIMP=.25]
      [SLP=2.00:DT= 1.00]
      [LOSS= 2 :CN= 51.0]

001:0083---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202A           3.05     .130 No_date    1:16   14.59  n/a
        Major System /  03:remainder      1.77     .107 No_date    1:16   14.59  n/a
        Minor System \  04:LID            1.28     .023 No_date    0:57   14.59  n/a

001:0084---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202B           1.55     .028 No_date    1:20    6.21 .104
      [CN= 41.0: N= 3.00]
      [Tp=  .21:DT= 5.00]

001:0085---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202B           1.55     .028 No_date    1:20    6.21  n/a
        Major System /  04:remainder      1.14     .025 No_date    1:20    6.21  n/a
        Minor System \  05:LID             .41     .003 No_date    1:00    6.21  n/a

001:0086---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202C           1.34     .032 No_date    1:20    8.03 .134
      [CN= 47.0: N= 3.00]
      [Tp=  .21:DT= 1.00]

001:0087---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202C           1.34     .032 No_date    1:20    8.03  n/a
        Major System /  05:remainder       .75     .026 No_date    1:20    8.03  n/a
        Minor System \  06:LID             .59     .006 No_date    1:02    8.03  n/a

001:0088---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202D           1.96     .049 No_date    1:15    7.37 .123
      [CN= 45.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0089---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202D           1.96     .049 No_date    1:15    7.37  n/a
        Major System /  06:remainder      1.06     .040 No_date    1:15    7.37  n/a
        Minor System \  07:LID             .90     .009 No_date    1:00    7.37  n/a

001:0090---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-2         33.10     .587 No_date    1:40    9.41  n/a
                      +  03:remainder      1.77     .107 No_date    1:16   14.59  n/a
                      +  04:remainder      1.14     .025 No_date    1:20    6.21  n/a
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                  +  05:remainder       .75     .026 No_date    1:20    8.03  n/a
                  +  06:remainder      1.06     .040 No_date    1:15    7.37  n/a
     [DT= 1.00]  SUM=  07:C           37.82     .697 No_date    1:35    9.47  n/a

001:0091--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-3          .53     .010 No_date    1:12    4.96 .083
      [CN= 36.0: N= 3.00]
      [Tp=  .11:DT= 1.00]

001:0092--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:203A          1.96     .106 No_date    1:14   16.51 .276
      [XIMP=.01:TIMP=.31]
      [SLP=3.00:DT= 1.00]
      [LOSS= 2 :CN= 53.0]

001:0093--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203A          1.96     .106 No_date    1:14   16.51  n/a
        Major System /  03:remainder       .69     .071 No_date    1:14   16.51  n/a
        Minor System \  04:LID            1.27     .035 No_date    1:00   16.51  n/a

001:0094--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:203B           .52     .023 No_date    1:13   12.40 .207
      [CN= 58.0: N= 3.00]
      [Tp=  .14:DT= 1.00]

001:0095--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203B           .52     .023 No_date    1:13   12.40  n/a
        Major System /  04:remainder      .27     .019 No_date    1:13   12.40  n/a
        Minor System \  05:LID            .25     .004 No_date    0:59   12.40  n/a

001:0096--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-3          .53     .010 No_date    1:12    4.96  n/a
                  +  03:remainder       .69     .071 No_date    1:14   16.51  n/a
                  +  04:D               .27     .019 No_date    1:13   12.40  n/a
     [DT= 1.00]  SUM=  04:D            2.45     .161 No_date    1:14   11.51  n/a

001:0097--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4          .14     .008 No_date    1:01   11.34 .189
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0098--------------------------------------------------------------------------
     CHICAGO STORM
      [SDT= 5.00:SDUR=   3.00:PTOT=  73.34]
      {A/B/C=3140.255/  18.189/    .918: R=.9996}

001:0099--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1          .40     .024 No_date    1:15   17.24 .235
      [CN= 60.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0100--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2          .80     .078 No_date    1:11   24.63 .336
      [CN= 69.0: N= 3.00]
      [Tp=  .12:DT= 1.00]

001:0101--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:UNC-2          .80     .078 No_date    1:11   24.63  n/a
        Major System /  03:remainder      .65     .074 No_date    1:11   24.63  n/a
        Minor System \  04:LID            .15     .004 No_date    0:54   24.63  n/a

001:0102--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:UNC-1          .40     .024 No_date    1:15   17.24  n/a
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                  +  03:remainder        .65     .074 No_date    1:11   24.63  n/a
      [DT= 1.00]  SUM=  05:A             1.05     .097 No_date    1:12   21.80  n/a

001:0103--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-1        99.40    1.934 No_date    2:10   14.49 .198
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0104--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-3          .27     .020 No_date    1:07   17.24 .235
      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]

001:0105--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    03:201A          5.06     .507 No_date    1:11   27.64 .377
      [XIMP=.01:TIMP=.24]
      [SLP=4.00:DT= 1.00]
      [LOSS= 2 :CN= 62.0]

001:0106--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201A          5.06     .507 No_date    1:11   27.64  n/a
        Major System /  04:remainder     4.33     .486 No_date    1:11   27.64  n/a
        Minor System \  05:LID            .73     .021 No_date    0:47   27.64  n/a

001:0107--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201B          1.08     .071 No_date    1:24   23.50 .320
      [CN= 68.0: N= 3.00]
      [Tp=  .26:DT= 1.00]

001:0108--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201B          1.08     .071 No_date    1:24   23.50  n/a
        Major System /  05:remainder      .90     .067 No_date    1:24   23.50  n/a
        Minor System \  06:LID            .18     .004 No_date    0:58   23.50  n/a

001:0109--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201C          1.98     .131 No_date    1:20   22.04 .300
      [CN= 66.0: N= 3.00]
      [Tp=  .22:DT= 5.00]

001:0110--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201C          1.98     .131 No_date    1:20   22.04  n/a
        Major System /  06:remainder     1.73     .125 No_date    1:20   22.04  n/a
        Minor System \  07:LID            .25     .006 No_date    0:55   22.04  n/a

001:0111--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:201D          5.54     .217 No_date    1:30   17.24 .235
      [CN= 60.0: N= 3.00]
      [Tp=  .36:DT= 5.00]

001:0112--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1        99.40    1.934 No_date    2:10   14.49  n/a
                     +  02:UNC-3          .27     .020 No_date    1:07   17.24  n/a
                     +  04:remainder     4.33     .486 No_date    1:11   27.64  n/a
                     +  05:remainder      .90     .067 No_date    1:24   23.50  n/a
                     +  06:remainder     1.73     .125 No_date    1:20   22.04  n/a
                     +  07:201D          5.54     .217 No_date    1:30   17.24  n/a
      [DT= 1.00]  SUM=  08:B           112.17    2.197 No_date    2:00   15.33  n/a

001:0113--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-2        33.10     .901 No_date    1:40   14.18 .193
      [CN= 51.0: N= 3.00]
      [Tp=  .48:DT= 5.00]
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001:0114---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:202A           3.05     .197 No_date    1:15   20.78 .283
      [XIMP=.01:TIMP=.25]
      [SLP=2.00:DT= 1.00]
      [LOSS= 2 :CN= 51.0]

001:0115---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202A           3.05     .197 No_date    1:15   20.78  n/a
        Major System /  03:remainder      2.09     .174 No_date    1:15   20.78  n/a
        Minor System \  04:LID             .96     .023 No_date    0:55   20.78  n/a

001:0116---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202B           1.55     .043 No_date    1:20    9.63 .131
      [CN= 41.0: N= 3.00]
      [Tp=  .21:DT= 5.00]

001:0117---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202B           1.55     .043 No_date    1:20    9.63  n/a
        Major System /  04:remainder      1.27     .040 No_date    1:20    9.63  n/a
        Minor System \  05:LID             .28     .003 No_date    1:00    9.63  n/a

001:0118---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202C           1.34     .049 No_date    1:20   12.24 .167
      [CN= 47.0: N= 3.00]
      [Tp=  .21:DT= 1.00]

001:0119---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202C           1.34     .049 No_date    1:20   12.24  n/a
        Major System /  05:remainder       .93     .043 No_date    1:20   12.24  n/a
        Minor System \  06:LID             .41     .006 No_date    1:00   12.24  n/a

001:0120---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202D           1.96     .075 No_date    1:15   11.30 .154
      [CN= 45.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0121---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202D           1.96     .075 No_date    1:15   11.30  n/a
        Major System /  06:remainder      1.32     .066 No_date    1:15   11.30  n/a
        Minor System \  07:LID             .64     .009 No_date    0:58   11.30  n/a

001:0122---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-2         33.10     .901 No_date    1:40   14.18  n/a
                      +  03:remainder      2.09     .174 No_date    1:15   20.78  n/a
                      +  04:remainder      1.27     .040 No_date    1:20    9.63  n/a
                      +  05:remainder       .93     .043 No_date    1:20   12.24  n/a
                      +  06:remainder      1.32     .066 No_date    1:15   11.30  n/a
      [DT= 1.00]  SUM=  07:C             38.71    1.083 No_date    1:35   14.24  n/a

001:0123---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-3           .53     .015 No_date    1:11    7.79 .106
      [CN= 36.0: N= 3.00]
      [Tp=  .11:DT= 1.00]

001:0124---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:203A           1.96     .159 No_date    1:12   23.36 .319
      [XIMP=.01:TIMP=.31]
      [SLP=3.00:DT= 1.00]
      [LOSS= 2 :CN= 53.0]

001:0125---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203A           1.96     .159 No_date    1:12   23.36  n/a
        Major System /  03:remainder       .95     .124 No_date    1:12   23.36  n/a
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       Minor System \  04:LID            1.01     .035 No_date    0:57   23.36  n/a

001:0126---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:203B            .52     .035 No_date    1:13   18.28 .249
      [CN= 58.0: N= 3.00]
      [Tp=  .14:DT= 1.00]

001:0127---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203B            .52     .035 No_date    1:13   18.28  n/a
        Major System /  04:remainder       .33     .030 No_date    1:13   18.28  n/a
        Minor System \  05:LID             .19     .004 No_date    0:57   18.28  n/a

001:0128---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-3           .53     .015 No_date    1:11    7.79  n/a
                      +  03:remainder       .95     .124 No_date    1:12   23.36  n/a
                      +  04:D               .33     .030 No_date    1:13   18.28  n/a
      [DT= 1.00]  SUM=  04:D              2.96     .279 No_date    1:12   17.79  n/a

001:0129---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4           .14     .012 No_date    1:01   17.24 .235
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0130---------------------------------------------------------------------------
     CHICAGO STORM
      [SDT= 5.00:SDUR=   3.00:PTOT=  83.51]
      {A/B/C=4206.008/  21.190/    .946: R=.9996}

001:0131---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1           .40     .031 No_date    1:15   22.25 .266
      [CN= 60.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0132---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2           .80     .098 No_date    1:11   30.96 .371
      [CN= 69.0: N= 3.00]
      [Tp=  .12:DT= 1.00]

001:0133---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:UNC-2           .80     .098 No_date    1:11   30.96  n/a
        Major System /  03:remainder       .67     .094 No_date    1:11   30.96  n/a
        Minor System \  04:LID             .13     .004 No_date    0:53   30.96  n/a

001:0134---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:UNC-1           .40     .031 No_date    1:15   22.25  n/a
                      +  03:remainder       .67     .094 No_date    1:11   30.96  n/a
      [DT= 1.00]  SUM=  05:A              1.07     .124 No_date    1:12   27.72  n/a

001:0135---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-1         99.40    2.531 No_date    2:10   18.74 .224
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0136---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-3           .27     .026 No_date    1:07   22.25 .266
      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]

001:0137---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    03:201A            5.06     .642 No_date    1:10   34.09 .408
      [XIMP=.01:TIMP=.24]
      [SLP=4.00:DT= 1.00]
      [LOSS= 2 :CN= 62.0]
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001:0138---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201A           5.06     .642 No_date    1:10   34.09  n/a
        Major System /  04:remainder      4.46     .621 No_date    1:10   34.09  n/a
        Minor System \  05:LID             .60     .021 No_date    0:45   34.09  n/a

001:0139---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201B           1.08     .091 No_date    1:24   29.67 .355
      [CN= 68.0: N= 3.00]
      [Tp=  .26:DT= 1.00]

001:0140---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201B           1.08     .091 No_date    1:24   29.67  n/a
        Major System /  05:remainder       .93     .086 No_date    1:24   29.67  n/a
        Minor System \  06:LID             .15     .004 No_date    0:57   29.67  n/a

001:0141---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201C           1.98     .168 No_date    1:20   27.93 .334
      [CN= 66.0: N= 3.00]
      [Tp=  .22:DT= 5.00]

001:0142---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201C           1.98     .168 No_date    1:20   27.93  n/a
        Major System /  06:remainder      1.78     .162 No_date    1:20   27.93  n/a
        Minor System \  07:LID             .20     .006 No_date    0:55   27.93  n/a

001:0143---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:201D           5.54     .284 No_date    1:30   22.25 .266
      [CN= 60.0: N= 3.00]
      [Tp=  .36:DT= 5.00]

001:0144---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1         99.40    2.531 No_date    2:10   18.74  n/a
                     +  02:UNC-3           .27     .026 No_date    1:07   22.25  n/a
                     +  04:remainder      4.46     .621 No_date    1:10   34.09  n/a
                     +  05:remainder       .93     .086 No_date    1:24   29.67  n/a
                     +  06:remainder      1.78     .162 No_date    1:20   27.93  n/a
                     +  07:201D           5.54     .284 No_date    1:30   22.25  n/a
      [DT= 1.00]  SUM=  08:B            112.38    2.871 No_date    2:00   19.77  n/a

001:0145---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-2         33.10    1.176 No_date    1:40   18.26 .219
      [CN= 51.0: N= 3.00]
      [Tp=  .48:DT= 5.00]

001:0146---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:202A           3.05     .255 No_date    1:15   25.94 .311
      [XIMP=.01:TIMP=.25]
      [SLP=2.00:DT= 1.00]
      [LOSS= 2 :CN= 51.0]

001:0147---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202A           3.05     .255 No_date    1:15   25.94  n/a
        Major System /  03:remainder      2.27     .232 No_date    1:15   25.94  n/a
        Minor System \  04:LID             .78     .023 No_date    0:53   25.94  n/a

001:0148---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202B           1.55     .058 No_date    1:20   12.62 .151
      [CN= 41.0: N= 3.00]
      [Tp=  .21:DT= 5.00]

001:0149---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202B           1.55     .058 No_date    1:20   12.62  n/a
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```
       Major System /  04:remainder      1.33     .055 No_date    1:20   12.62  n/a
       Minor System \  05:LID             .22     .003 No_date    1:00   12.62  n/a

001:0150---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202C           1.34     .064 No_date    1:20   15.86 .190
      [CN= 47.0: N= 3.00]
      [Tp=  .21:DT= 1.00]

001:0151---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202C           1.34     .064 No_date    1:20   15.86  n/a
       Major System /  05:remainder      1.01     .058 No_date    1:20   15.86  n/a
       Minor System \  06:LID             .33     .006 No_date    0:59   15.86  n/a

001:0152---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202D           1.96     .099 No_date    1:15   14.70 .176
      [CN= 45.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0153---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202D           1.96     .099 No_date    1:15   14.70  n/a
       Major System /  06:remainder      1.45     .090 No_date    1:15   14.70  n/a
       Minor System \  07:LID             .51     .009 No_date    0:57   14.70  n/a

001:0154---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-2         33.10    1.176 No_date    1:40   18.26  n/a
                      +  03:remainder      2.27     .232 No_date    1:15   25.94  n/a
                      +  04:remainder      1.33     .055 No_date    1:20   12.62  n/a
                      +  05:remainder      1.01     .058 No_date    1:20   15.86  n/a
                      +  06:remainder      1.45     .090 No_date    1:15   14.70  n/a
      [DT= 1.00]  SUM=  07:C             39.16    1.418 No_date    1:35   18.32  n/a

001:0155---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-3           .53     .020 No_date    1:12   10.29 .123
      [CN= 36.0: N= 3.00]
      [Tp=  .11:DT= 1.00]

001:0156---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:203A           1.96     .203 No_date    1:11   29.02 .348
      [XIMP=.01:TIMP=.31]
      [SLP=3.00:DT= 1.00]
      [LOSS= 2 :CN= 53.0]

001:0157---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203A           1.96     .203 No_date    1:11   29.02  n/a
       Major System /  03:remainder      1.09     .168 No_date    1:11   29.02  n/a
       Minor System \  04:LID             .87     .035 No_date    0:56   29.02  n/a

001:0158---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:203B           .52     .044 No_date    1:13   23.23 .278
      [CN= 58.0: N= 3.00]
      [Tp=  .14:DT= 1.00]

001:0159---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203B           .52     .044 No_date    1:13   23.23  n/a
       Major System /  04:remainder      .36     .040 No_date    1:13   23.23  n/a
       Minor System \  05:LID             .16     .004 No_date    0:56   23.23  n/a

001:0160---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-3           .53     .020 No_date    1:12   10.29  n/a
                      +  03:remainder      1.09     .168 No_date    1:11   29.02  n/a
                      +  04:D              .36     .040 No_date    1:13   23.23  n/a
      [DT= 1.00]  SUM=  04:D              3.25     .375 No_date    1:11   22.91  n/a
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001:0161---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4            .14     .016 No_date    1:01   22.25 .266
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0162---------------------------------------------------------------------------
     CHICAGO STORM
      [SDT= 5.00:SDUR=   3.00:PTOT=  93.30]
      {A/B/C=4789.414/  21.844/    .949: R=.9996}

001:0163---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1            .40     .039 No_date    1:15   27.47 .294
      [CN= 60.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0164---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2            .80     .119 No_date    1:11   37.43 .401
      [CN= 69.0: N= 3.00]
      [Tp=  .12:DT= 1.00]

001:0165---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:UNC-2            .80     .119 No_date    1:11   37.43  n/a
        Major System /  03:remainder        .69     .115 No_date    1:11   37.43  n/a
        Minor System \  04:LID              .11     .004 No_date    0:51   37.43  n/a

001:0166---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:UNC-1            .40     .039 No_date    1:15   27.47  n/a
                      +  03:remainder        .69     .115 No_date    1:11   37.43  n/a
      [DT= 1.00]  SUM=  05:A               1.09     .152 No_date    1:11   33.79  n/a

001:0167---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-1           99.40    3.139 No_date    2:10   23.19 .249
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0168---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-3            .27     .032 No_date    1:07   27.47 .294
      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]

001:0169---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    03:201A            5.06     .780 No_date    1:10   40.64 .436
      [XIMP=.01:TIMP=.24]
      [SLP=4.00:DT= 1.00]
      [LOSS= 2 :CN= 62.0]

001:0170---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201A            5.06     .780 No_date    1:10   40.64  n/a
        Major System /  04:remainder       4.55     .759 No_date    1:10   40.64  n/a
        Minor System \  05:LID              .51     .021 No_date    0:43   40.64  n/a

001:0171---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201B            1.08     .110 No_date    1:23   35.99 .386
      [CN= 68.0: N= 3.00]
      [Tp=  .26:DT= 1.00]

001:0172---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201B            1.08     .110 No_date    1:23   35.99  n/a
        Major System /  05:remainder        .96     .106 No_date    1:23   35.99  n/a
        Minor System \  06:LID              .12     .004 No_date    0:56   35.99  n/a

001:0173---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201C            1.98     .205 No_date    1:20   33.98 .364
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      [CN= 66.0: N= 3.00]
      [Tp=  .22:DT= 5.00]

001:0174---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201C            1.98     .205 No_date    1:20   33.98  n/a
        Major System /  06:remainder       1.81     .199 No_date    1:20   33.98  n/a
        Minor System \  07:LID              .17     .006 No_date    0:55   33.98  n/a

001:0175---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:201D            5.54     .353 No_date    1:30   27.47 .294
      [CN= 60.0: N= 3.00]
      [Tp=  .36:DT= 5.00]

001:0176---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1          99.40    3.139 No_date    2:10   23.19  n/a
                     +  02:UNC-3            .27     .032 No_date    1:07   27.47  n/a
                     +  04:remainder       4.55     .759 No_date    1:10   40.64  n/a
                     +  05:remainder        .96     .106 No_date    1:23   35.99  n/a
                     +  06:remainder       1.81     .199 No_date    1:20   33.98  n/a
                     +  07:201D            5.54     .353 No_date    1:30   27.47  n/a
      [DT= 1.00]  SUM=  08:B             112.53    3.558 No_date    2:00   24.40  n/a

001:0177---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-2          33.10    1.456 No_date    1:40   22.55 .242
      [CN= 51.0: N= 3.00]
      [Tp=  .48:DT= 5.00]

001:0178---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:202A            3.05     .317 No_date    1:13   31.25 .335
      [XIMP=.01:TIMP=.25]
      [SLP=2.00:DT= 1.00]
      [LOSS= 2 :CN= 51.0]

001:0179---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202A            3.05     .317 No_date    1:13   31.25  n/a
        Major System /  03:remainder       2.39     .294 No_date    1:13   31.25  n/a
        Minor System \  04:LID              .66     .023 No_date    0:51   31.25  n/a

001:0180---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202B            1.55     .072 No_date    1:20   15.80 .169
      [CN= 41.0: N= 3.00]
      [Tp=  .21:DT= 5.00]

001:0181---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202B            1.55     .072 No_date    1:20   15.80  n/a
        Major System /  04:remainder       1.37     .069 No_date    1:20   15.80  n/a
        Minor System \  05:LID              .18     .003 No_date    0:55   15.80  n/a

001:0182---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202C            1.34     .079 No_date    1:20   19.70 .211
      [CN= 47.0: N= 3.00]
      [Tp=  .21:DT= 1.00]

001:0183---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202C            1.34     .079 No_date    1:20   19.70  n/a
        Major System /  05:remainder       1.07     .073 No_date    1:20   19.70  n/a
        Minor System \  06:LID              .27     .006 No_date    0:58   19.70  n/a

001:0184---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:202D            1.96     .123 No_date    1:15   18.31 .196
      [CN= 45.0: N= 3.00]
      [Tp=  .15:DT= 1.00]
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001:0185---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:202D           1.96     .123 No_date    1:15   18.31  n/a
        Major System /  06:remainder      1.54     .114 No_date    1:15   18.31  n/a
        Minor System \  07:LID             .42     .009 No_date    0:56   18.31  n/a

001:0186---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-2         33.10    1.456 No_date    1:40   22.55  n/a
                      +  03:remainder      2.39     .294 No_date    1:13   31.25  n/a
                      +  04:remainder      1.37     .069 No_date    1:20   15.80  n/a
                      +  05:remainder      1.07     .073 No_date    1:20   19.70  n/a
                      +  06:remainder      1.54     .114 No_date    1:15   18.31  n/a
      [DT= 1.00]  SUM=  07:C              39.47    1.755 No_date    1:35   22.60  n/a

001:0187---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-3           .53     .025 No_date    1:11   12.97 .139
      [CN= 36.0: N= 3.00]
      [Tp=  .11:DT= 1.00]

001:0188---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:203A           1.96     .250 No_date    1:10   34.83 .373
      [XIMP=.01:TIMP=.31]
      [SLP=3.00:DT= 1.00]
      [LOSS= 2 :CN= 53.0]

001:0189---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203A           1.96     .250 No_date    1:10   34.83  n/a
        Major System /  03:remainder      1.20     .215 No_date    1:10   34.83  n/a
        Minor System \  04:LID             .76     .035 No_date    0:54   34.83  n/a

001:0190---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:203B           .52     .054 No_date    1:13   28.37 .304
      [CN= 58.0: N= 3.00]
      [Tp=  .14:DT= 1.00]

001:0191---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203B           .52     .054 No_date    1:13   28.37  n/a
        Major System /  04:remainder      .39     .049 No_date    1:13   28.37  n/a
        Minor System \  05:LID             .13     .004 No_date    0:55   28.37  n/a

001:0192---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-3           .53     .025 No_date    1:11   12.97  n/a
                      +  03:remainder     1.20     .215 No_date    1:10   34.83  n/a
                      +  04:D             .39     .049 No_date    1:13   28.37  n/a
      [DT= 1.00]  SUM=  04:D             3.45     .480 No_date    1:11   28.11  n/a

001:0193---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4           .14     .019 No_date    1:01   27.47 .294
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0194---------------------------------------------------------------------------
     READ STORM
      Filename = Hzl12h15.STM
      Comment  =
      [SDT=15.00:SDUR=  12.00:PTOT= 212.00]

001:0195---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:UNC-1           .40     .041 No_date   10:01  109.88 .518
      [CN= 60.0: N= 3.00]
      [Tp=  .15:DT= 1.00]

001:0196---------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-2           .80     .095 No_date   10:00  132.04 .623
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      [CN= 69.0: N= 3.00]
      [Tp=  .12:DT= 1.00]

001:0197---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:UNC-2             .80     .095 No_date   10:00  132.04  n/a
        Major System /  03:remainder         .68     .090 No_date   10:00  132.04  n/a
        Minor System \  04:LID               .12     .004 No_date    3:17  132.04  n/a

001:0198---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:UNC-1             .40     .041 No_date   10:01  109.88  n/a
                      +  03:remainder         .68     .090 No_date   10:00  132.04  n/a
      [DT= 1.00]  SUM=  05:A                1.08     .132 No_date   10:00  123.86  n/a

001:0199---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:EXT-1           99.40    7.075 No_date   11:05   96.59 .456
      [CN= 53.0: N= 3.00]
      [Tp=  .83:DT= 5.00]

001:0200---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:UNC-3             .27     .028 No_date   10:00  109.88 .518
      [CN= 60.0: N= 3.00]
      [Tp=  .08:DT= 1.00]

001:0201---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    03:201A              5.06     .593 No_date   10:00  135.34 .638
      [XIMP=.01:TIMP=.24]
      [SLP=4.00:DT= 1.00]
      [LOSS= 2 :CN= 62.0]

001:0202---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201A              5.06     .593 No_date   10:00  135.34  n/a
        Major System /  04:remainder        4.47     .572 No_date   10:00  135.34  n/a
        Minor System \  05:LID               .59     .021 No_date    3:07  135.34  n/a

001:0203---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201B              1.08     .123 No_date   10:03  129.24 .610
      [CN= 68.0: N= 3.00]
      [Tp=  .26:DT= 1.00]

001:0204---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201B              1.08     .123 No_date   10:03  129.24  n/a
        Major System /  05:remainder         .96     .118 No_date   10:03  129.24  n/a
        Minor System \  06:LID               .12     .004 No_date    3:24  129.24  n/a

001:0205---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:201C              1.98     .222 No_date   10:00  124.71 .588
      [CN= 66.0: N= 3.00]
      [Tp=  .22:DT= 5.00]

001:0206---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    03:201C              1.98     .222 No_date   10:00  124.71  n/a
        Major System /  06:remainder        1.81     .216 No_date   10:00  124.71  n/a
        Minor System \  07:LID               .17     .006 No_date    3:15  124.71  n/a

001:0207---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:201D              5.54     .528 No_date   10:05  109.89 .518
      [CN= 60.0: N= 3.00]
      [Tp=  .36:DT= 5.00]

001:0208---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-1           99.40    7.075 No_date   11:05   96.59  n/a
                      +  02:UNC-3             .27     .028 No_date   10:00  109.88  n/a
                      +  04:remainder        4.47     .572 No_date   10:00  135.34  n/a
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                  +  05:remainder       .96     .118 No_date   10:03  129.24  n/a
                  +  06:remainder      1.81     .216 No_date   10:00  124.71  n/a
                  +  07:201D           5.54     .528 No_date   10:05  109.89  n/a
   [DT= 1.00]  SUM=  08:B            112.44    8.208 No_date   11:00   99.55  n/a

001:0209--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   CALIB NASHYD       01:EXT-2         33.10    2.538 No_date   10:20   93.59 .441
    [CN= 51.0: N= 3.00]
    [Tp=  .48:DT= 5.00]

001:0210--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   DESIGN STANDHYD    02:202A           3.05     .304 No_date   10:02  113.27 .534
    [XIMP=.01:TIMP=.25]
    [SLP=2.00:DT= 1.00]
    [LOSS= 2 :CN= 51.0]

001:0211--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   COMPUTE DUALHYD    02:202A           3.05     .304 No_date   10:02  113.27  n/a
      Major System /  03:remainder      2.35     .282 No_date   10:02  113.27  n/a
      Minor System \  04:LID             .70     .023 No_date    3:51  113.27  n/a

001:0212--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   CALIB NASHYD       02:202B           1.55     .107 No_date   10:00   72.49 .342
    [CN= 41.0: N= 3.00]
    [Tp=  .21:DT= 5.00]

001:0213--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   COMPUTE DUALHYD    02:202B           1.55     .107 No_date   10:00   72.49  n/a
      Major System /  04:remainder      1.41     .104 No_date   10:00   72.49  n/a
      Minor System \  05:LID             .14     .003 No_date    3:35   72.49  n/a

001:0214--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   CALIB NASHYD       02:202C           1.34     .107 No_date   10:03   85.05 .401
    [CN= 47.0: N= 3.00]
    [Tp=  .21:DT= 1.00]

001:0215--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   COMPUTE DUALHYD    02:202C           1.34     .107 No_date   10:03   85.05  n/a
      Major System /  05:remainder      1.11     .101 No_date   10:03   85.05  n/a
      Minor System \  06:LID             .23     .006 No_date    4:07   85.05  n/a

001:0216--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   CALIB NASHYD       02:202D           1.96     .153 No_date   10:01   80.77 .381
    [CN= 45.0: N= 3.00]
    [Tp=  .15:DT= 1.00]

001:0217--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   COMPUTE DUALHYD    02:202D           1.96     .153 No_date   10:01   80.77  n/a
      Major System /  06:remainder      1.60     .144 No_date   10:01   80.77  n/a
      Minor System \  07:LID             .36     .009 No_date    4:08   80.77  n/a

001:0218--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   ADD HYD            01:EXT-2         33.10    2.538 No_date   10:20   93.59  n/a
                  +  03:remainder      2.35     .282 No_date   10:02  113.27  n/a
                  +  04:remainder      1.41     .104 No_date   10:00   72.49  n/a
                  +  05:remainder      1.11     .101 No_date   10:03   85.05  n/a
                  +  06:remainder      1.60     .144 No_date   10:01   80.77  n/a
   [DT= 1.00]  SUM=  07:C            39.57    3.094 No_date   10:10   93.25  n/a

001:0219--------------ID:NHYD----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   CALIB NASHYD       01:EXT-3           .53     .033 No_date   10:01   62.43 .294
    [CN= 36.0: N= 3.00]
    [Tp=  .11:DT= 1.00]
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001:0220---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     DESIGN STANDHYD    02:203A           1.96     .211 No_date   10:01  122.08 .576
      [XIMP=.01:TIMP=.31]
      [SLP=3.00:DT= 1.00]
      [LOSS= 2 :CN= 53.0]

001:0221---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203A           1.96     .211 No_date   10:01  122.08  n/a
        Major System /  03:remainder      1.07     .176 No_date   10:01  122.08  n/a
        Minor System \  04:LID             .89     .035 No_date    6:05  122.08  n/a

001:0222---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:203B            .52     .053 No_date   10:01  109.22 .515
      [CN= 58.0: N= 3.00]
      [Tp=  .14:DT= 1.00]

001:0223---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     COMPUTE DUALHYD    02:203B            .52     .053 No_date   10:01  109.22  n/a
        Major System /  04:remainder       .39     .048 No_date   10:01  109.22  n/a
        Minor System \  05:LID             .13     .004 No_date    4:10  109.22  n/a

001:0224---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:EXT-3           .53     .033 No_date   10:01   62.43  n/a
                      +  03:remainder      1.07     .176 No_date   10:01  122.08  n/a
                      +  04:D              .39     .048 No_date   10:01  109.22  n/a
      [DT= 1.00]  SUM=  04:D              3.20     .419 No_date   10:01  102.33  n/a

001:0225---------------ID:NHYD-----------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       01:UNC-4           .14     .015 No_date   10:00  109.88 .518
      [CN= 60.0: N= 3.00]
      [Tp=  .03:DT= 1.00]

001:0226---------------------------------------------------------------------------
      FINISH
-------------------------------------------------------------------------------
-
*******************************************************************************
*
     WARNINGS / ERRORS / NOTES
     -------------------------
 001:0033 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0065 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0097 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0129 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0161 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0193 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0225 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
   Simulation ended on 2018-12-03     at 22:33:25
```

Project:	**8th Line**
Project #:	
Designed By:	J.Scott
Date:	5-Dec-2018

Drawdown Time Infiltration Trench

Drainage Area (half of a roof) 164 m^2

Infiltration Rate

Hydrologic Soil Group B 11.4 mm/hr

Infiltration rate at the proposed bottom elevation of the infiltration gallery must be divided by a safety correction factor:

Ratio of mean measured infiltration rates = 11.40 / 11.40 = 1 therefore, safety correction factor is ----------> 2

Design infiltration Rate determined by dividing mean infiltration rate at bottom of infiltration trench by the safety correction factor:

Design Infiltration Rate = 5.7 mm/hr

Size Infiltration Gallery

Infiltration Rate (m/hr)	Infiltration Rate (m^3/hr)	Surface Area of Infiltration[1] (m^2)	Required Volume of Infiltration per Cell (m^3)	Drawdown Time (hrs)	Max. Depth of Storage below Trench (m)
0.0057	0.1068	18.7	2.1	24	0.34

[1] as per MOE equation 4.3