Geopak Drainage – Import Atlas 14 Rainfall IDF into Drainage Library

1. Format IDF Data for Import

A. Create IDF Table using HydroCAD

Download data from PFDS server and format into .hci file. See Importing Atlas 14 into HydroCAD helpsheet.

Export Table from HydroCAD

- Open the *.hci file
- Change the time increment to 1 minute
- Select the Table tab

Note: HydroCAD uses a log-log interpolation which is recommended. This gives a smoother curve to the IDF than a straight line interpolation.

Instructions for creating log interpolated values without using HydroCAD is at Appendix A
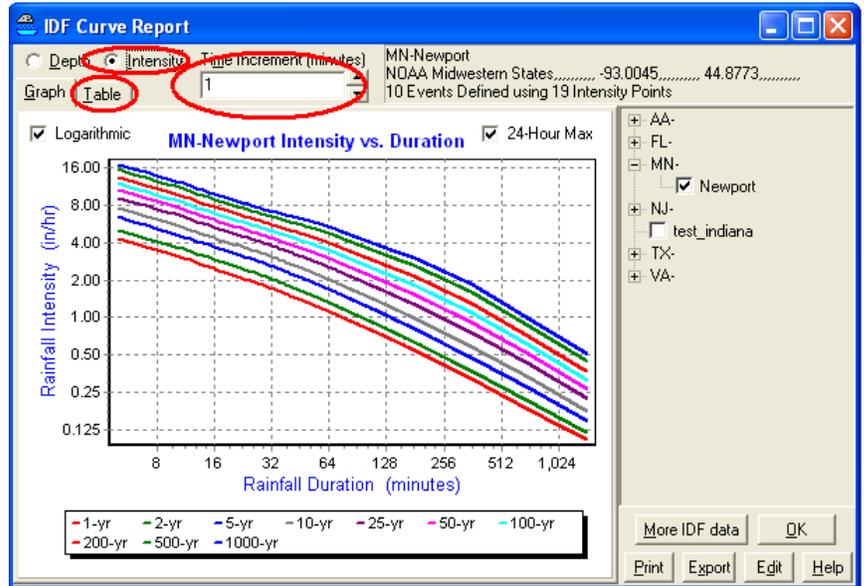
- On the Table dialog, select Export.
- Save table to .csv file
- Close out of HydroCAD

Edit Table in Excel

- Open .csv file in Excel
- Delete columns for 1-yr, 200-yr, 500-yr and 1000-yr values (keep 2, 5, 10, 25, 50 and 100 year frequencies)
- Delete all rows but durations = 7, 10, 15, 22, 30, 45, 60, 90 and 120 minutes. You may find it helpful to highlight rows that should remain and then delete the remainder.

Note: The interpolated values for 7, 22, 45, and 90 minutes are included to give a smoother IDF curve. Geopak Drainage does a straight line interpolation between durations in the library.

	A	B	C	D	E	F	G	H
1	Duration (minutes)	2-yr (in/hr)	5-yr (in/hr)	10-yr (in/hr)	25-yr (in/hr)	50-yr (in/hr)	100-yr (in/hr)	
2	7	4.35	5.53	6.52	7.95	9.17	10.33	
3	10	3.72	4.68	5.58	6.78	7.8	8.82	
4	15	3.04	3.84	4.52	5.52	6.32	7.16	
5	22	2.49	3.16	3.73	4.57	5.24	5.95	
6	30	2.12	2.7	3.2	3.92	4.5	5.12	
7	45	1.64	2.1	2.5	3.11	3.62	4.17	
8	60	1.37	1.75	2.1	2.64	3.1	3.6	
9	90	1.03	1.32	1.59	2.01	2.38	2.78	
10	120	0.84	1.08	1.3	1.66	1.98	2.32	
11								

MN-Newport Intensity vs. Durati
Ready   100%

- Last delete row 1 – the heading information.

	A	B	C	D	E	F	G
1	7	4.35	5.53	6.52	7.95	9.17	10.33
2	10	3.72	4.68	5.58	6.78	7.8	8.82
3	15	3.04	3.84	4.52	5.52	6.32	7.16
4	22	2.49	3.16	3.73	4.57	5.24	5.95
5	30	2.12	2.7	3.2	3.92	4.5	5.12
6	45	1.64	2.1	2.5	3.11	3.62	4.17
7	60	1.37	1.75	2.1	2.64	3.1	3.6
8	90	1.03	1.32	1.59	2.01	2.38	2.78
9	120	0.84	1.08	1.3	1.66	1.98	2.32
10							

- File > Save-As
- Select Save as type Formatted Text (Space delimited) *.prn
- Select Save

File name: IDF Import Table.prn
Save as type: Formatted Text (Space delimited) (*.prn)
XML Spreadsheet 2003 (*.xml)
Microsoft Excel 5.0/95 Workbook (*.xls)
CSV (Comma delimited) (*.csv)
Formatted Text (Space delimited) (*.prn)
Text (Macintosh) (*.txt)
Text (MS-DOS) (*.txt)
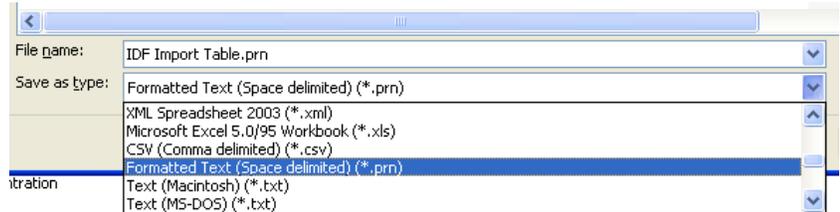
B. Change extension and verify

- In Windows Explorer, change extension to *.txt. Then open with note pad and verify file format:

IDF Import Table.txt - Notepad
File   Edit   Format   View   Help

```
    7    4.35    5.53    6.52    7.95    9.17   10.33
   10    3.72    4.68    5.58    6.78    7.8     8.82
   15    3.04    3.84    4.52    5.52    6.32    7.16
   22    2.49    3.16    3.73    4.57    5.24    5.95
   30    2.12    2.7     3.2     3.92    4.5     5.12
   45    1.64    2.1     2.5     3.11    3.62    4.17
   60    1.37    1.75    2.1     2.64    3.1     3.6
   90    1.03    1.32    1.59    2.01    2.38    2.78
  120    0.84    1.08    1.3     1.66    1.98    2.32
```

2. Create Project Drainage Library

Open MicroStation file and Open Geopak Drainage
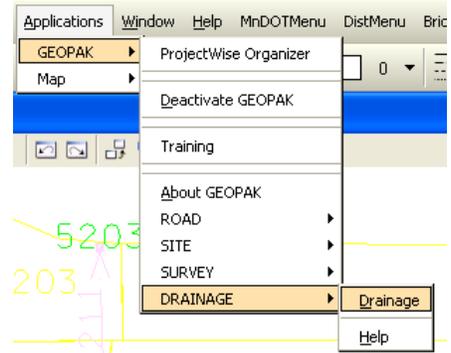
Go to Project > Drainage Library
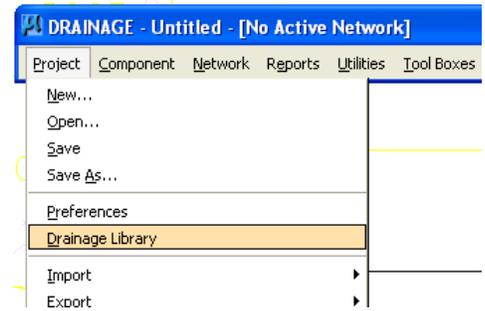
File > Open
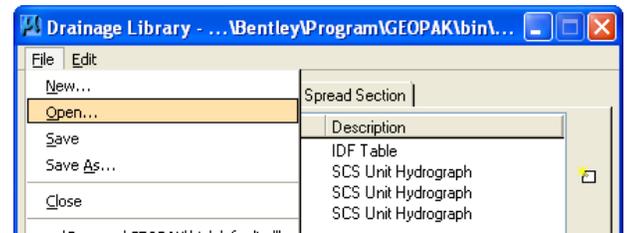
Open MnDOT Standard
Library from
CADDStandards\
MnDOTStandards
\DOT_GEOPAK\
dlb\MnDOT.dlb
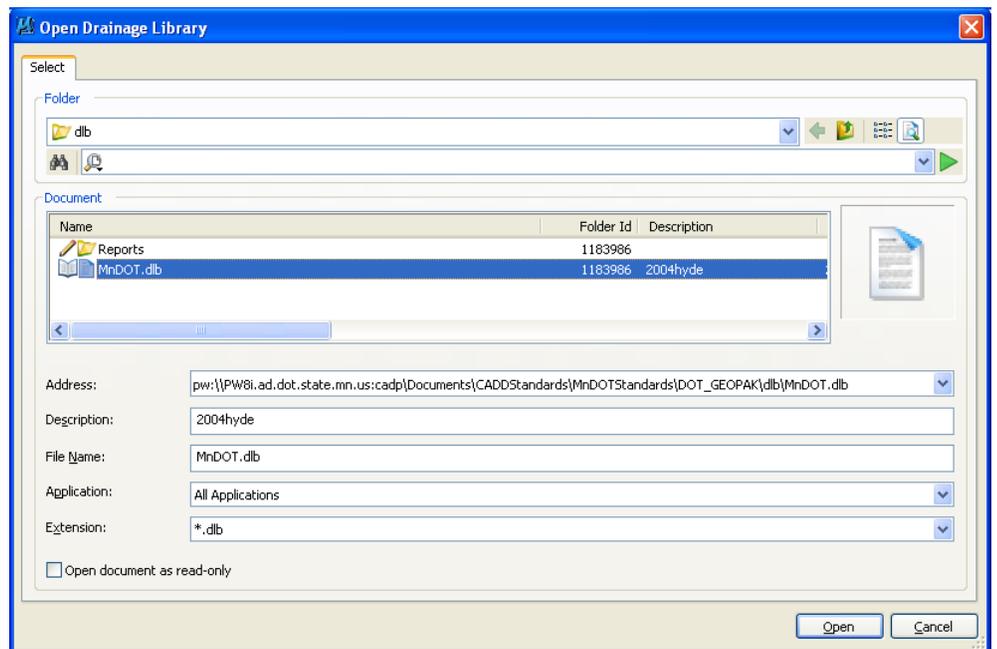
File > Save-As into Project Folder

- Use DGN file name for the project dlb
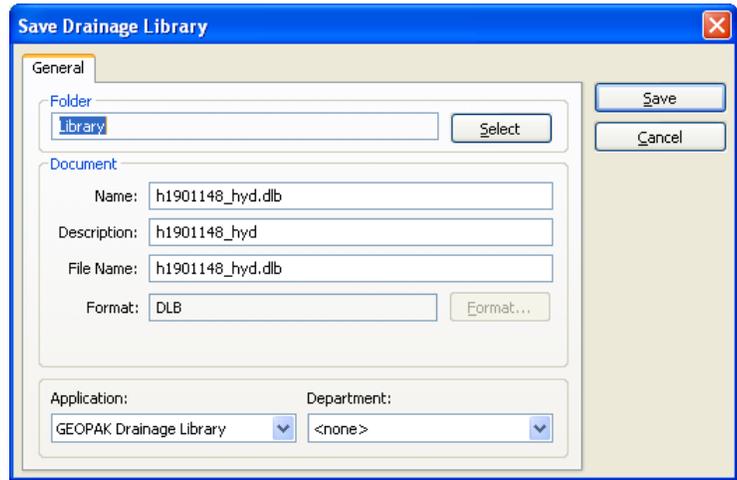
3. Import IDF Data into Library

A. Add new rainfall library item
Open Project Drainage Library

Go to Rainfall Tab and click on Add button
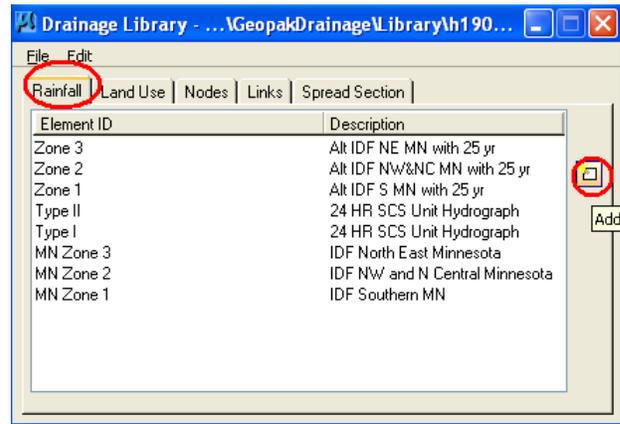
Enter Item ID = SP Number

Enter Description = Atlas 14 IDF

Data Type = Table

B. Import data from table
Select Import ASCII

On dialog to Select Rainfall Table to Import – navigate to IDF txt file and Open

Data should populate the fields.

Select OK
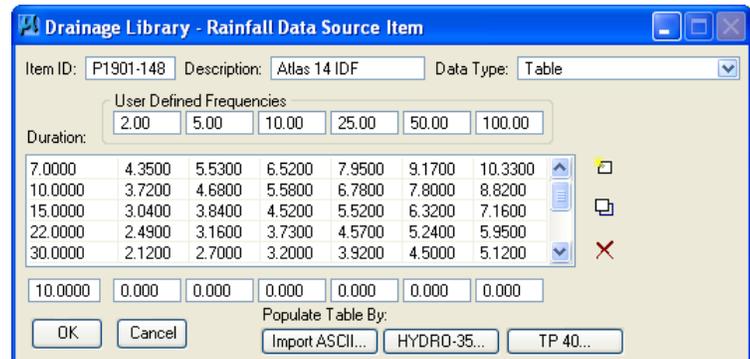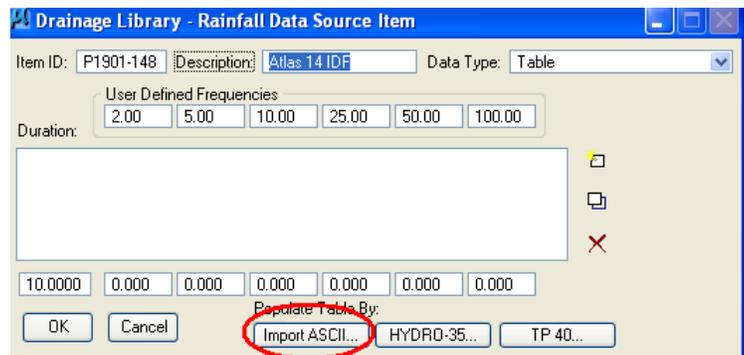
C. Save updated Project Library

File > Save to save the Project Drainage Library. Then close out of the library

Go to ProjectWise window, right-click on the Drainage Library file and select Update Server Copy
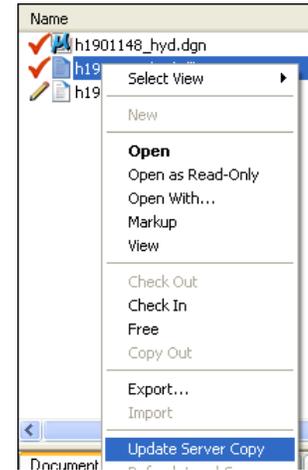
4. Update Project Preferences

Open Drainage project GDF file

A. Project Components

Go to Project > Preferences

Navigate to Project Components dialog

Select project Drainage Library
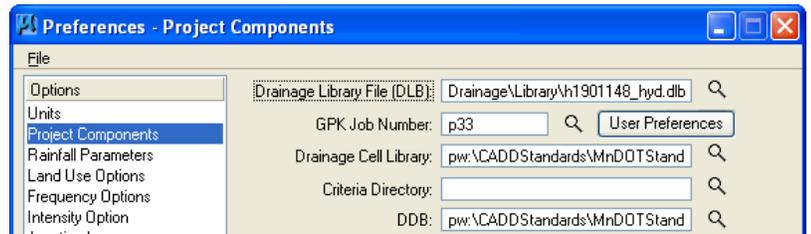
B. Rainfall Parameters

Navigate to Rainfall Parameters dialog

Select project rainfall table
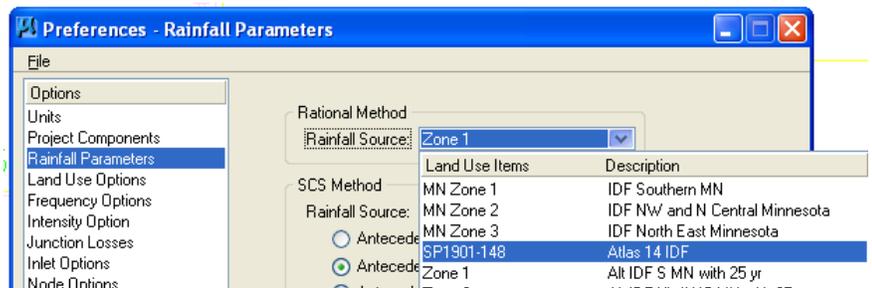
C. Frequency Options

Navigate to Frequency Options dialog

Select Design Frequency

OK

Save Drainage Project

5
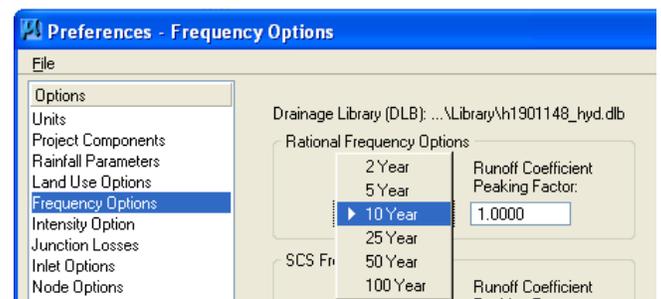
Options for Updating Drainage Library

Create IDF Curve values without HydroCAD
Download IDF (intensity-duration-frequency) values directly from Atlas 14 PFDS server.   Create log-log interpolated values for the 7, 22, 45, and 90 minute values (highly recommended) for each return period that is needed in the Drainage Library.

$$I_7 = 10^{(0.4854(\log I_{10} - \log I_5) + \log I_5)}$$

$$I_{22} = 10^{(0.5525(\log I_{30} - \log I_{15}) + \log I_{15})}$$

$$I_{45} = 10^{(0.585(\log I_{60} - \log I_{30}) + \log I_{3o})}$$

$$I_{90} = 10^{(0.585(\log I_{120} - \log I_{60}) + \log I_{60})}$$

I_n: Intensity (in/hr) at time n (minutes)

Use Excel to create a table that can be exported in space delimited format as explained in Create IDF with HydroCAD section.

Or values can be entered manually in the Drainage Library as explained below.

IDF Import Table.txt - Notepad

File Edit Format View Help

```
  7    4.35    5.53    6.52    7.95    9.17   10.33
 10    3.72    4.68    5.58    6.78    7.8     8.82
 15    3.04    3.84    4.52    5.52    6.32    7.16
 22    2.49    3.16    3.73    4.57    5.24    5.95
 30    2.12    2.7     3.2     3.92    4.5     5.12
 45    1.64    2.1     2.5     3.11    3.62    4.17
 60    1.37    1.75    2.1     2.64    3.1     3.6
 90    1.03    1.32    1.59    2.01    2.38    2.78
120    0.84    1.08    1.3     1.66    1.98    2.32
```

Manual Update of Drainage Library
Create Project Drainage Library as explained in Section 2. Add new rainfall library item as explained in Section 3.A

In Drainage Library – Rainfall Source Item Dialog fill in Rainfall Frequencies that will be used in the project in the User Defined Frequency boxes.

In boxes at the bottom of the table, enter duration and then appropriate intensities for that duration. When values for duration are complete, click on the Add Item button to add to the table. (Similar work flow to creating spread sections)

Drainage Library - Rainfall Data Source Item

Item ID: P 1234-56   Description: Rainfall Item   Data Type: Table

User Defined Frequencies
10.00   50.00   0.00   0.00   0.00   0.00

Duration:

| 7.0000 | 6.5400 | 8.2100 | ----- | ----- | ----- | ----- |
| 10.0000 | 5.7000 | 7.1400 | ----- | ----- | ----- | ----- |

Add Item

| 13.0000 | 5.020 | 6.300 | 0.000 | 0.000 | 0.000 | 0.000 |

Populate Table By:

OK   Cancel   Import ASCII...   HYDRO-35...   TP 40...

Return Period Options

Default Return Periods in the Drainage Library are 2, 5, 10, 25, 50 and 100 year. A maximum of 6 return periods are allowed for a library item. If you need a return period other than those listed above, you can supply an import file with any 6 return periods. Then after importing into the library, edit the headings to the appropriate return periods.

For example – need 2, 3, 5, 10, 50 and 100 year. Create import text file with columns for those frequencies. Import into Drainage library. Then edit headings.

If don't want to have 6 different frequencies, create import file so 6 columns of intensity data, include 0's for frequency columns not being populated. Edit headings after import.

5-8-2013 - LKS