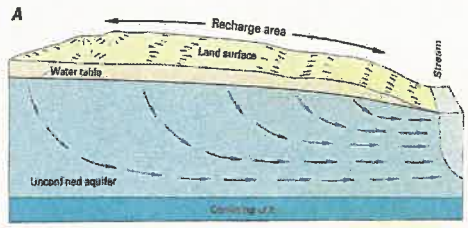
Northern Lancaster County Groundwater Study

Susquehanna River Basin Commission

Groundwater flows from hills to streams



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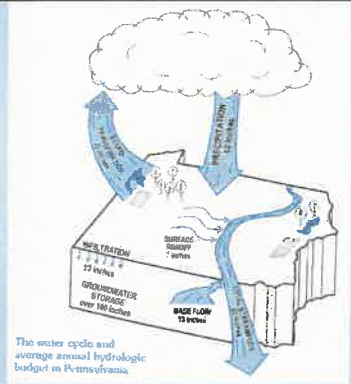
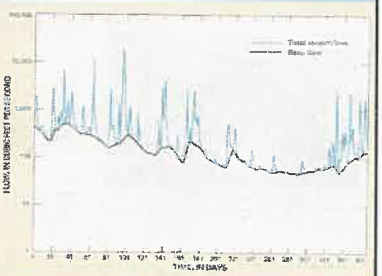


The water cycle and average annual hydrologic budget in Pennsylvania

Susquehanna River Basin Commission

Groundwater and Surface Water Contributions to Streamflow

Figure B–1. The ground-water component of streamflow was estimated from a streamflow hydrograph for the Homochitto River in Mississippi, using a method developed by the Institute of Hydrology, United Kingdom. (Institute of Hydrology, 1980, Low flow studies, Wallingford, Oxon, United Kingdom, Research Report No. 1.)



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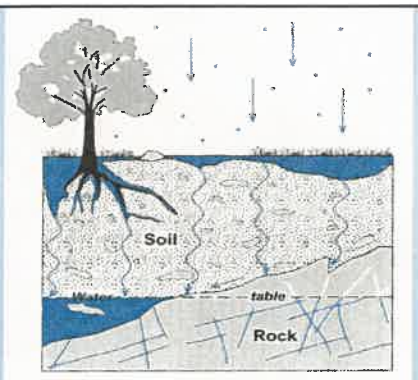

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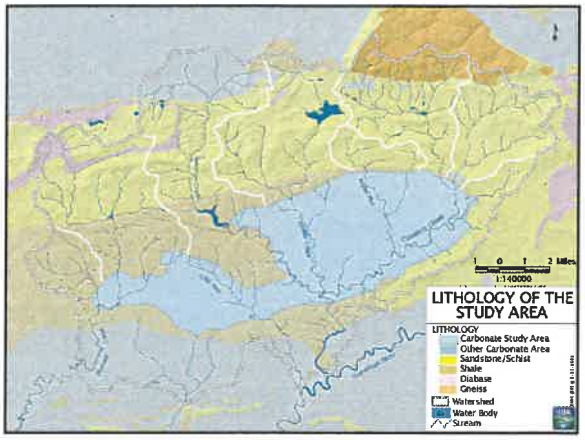
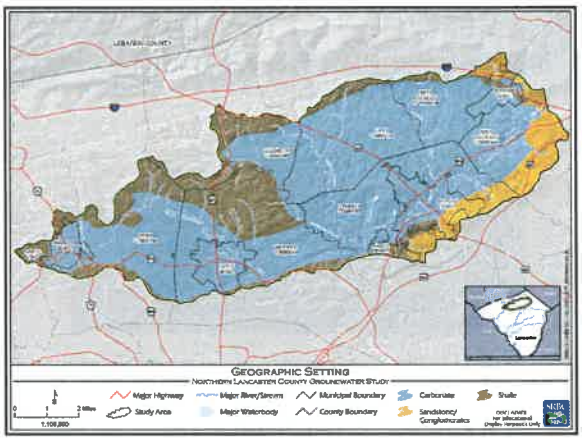
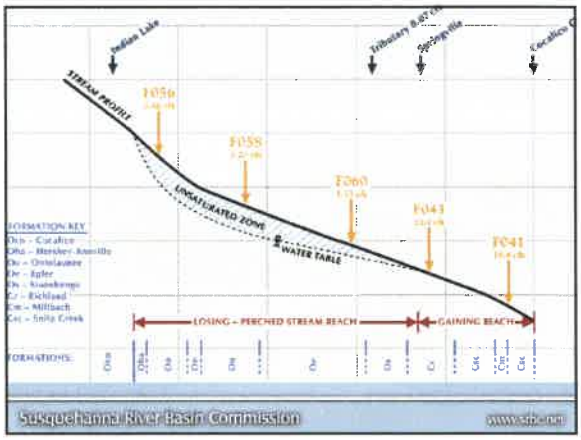



GEOGRAPHIC SETTING
NORTHERN LANCASTER COUNTY GROUNDWATER STUDY
Major Highway
Major River/Stream
Municipal Boundary
Carbonate
Shale
Study Area
Major Waterbody
County Boundary
Sandstone/ Conglomerates


Indian Lake
Tributary
Springville
Excalibur
STREAM PROFILE
F056
F058
F060
F043
F041
UNSATURATED ZONE
WATER TABLE
FORMATION KEY
LOSING - PERCHED STREAM REACH
GAINING REACH
FORMATIONS:
Susquehanna River Basin Commission
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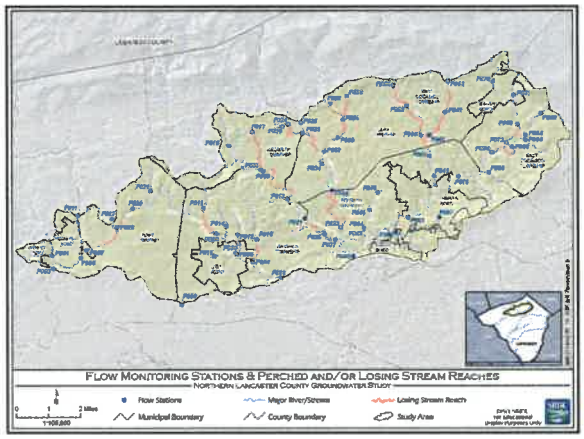
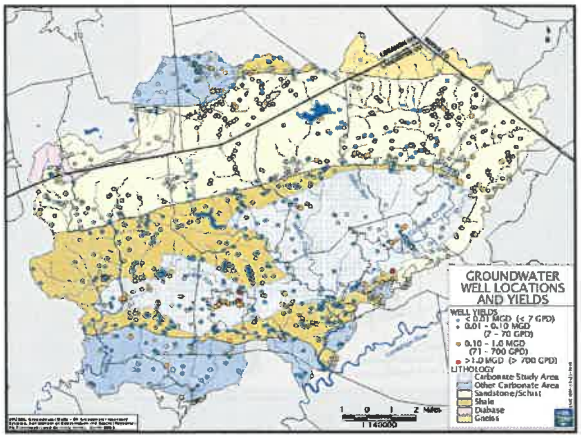
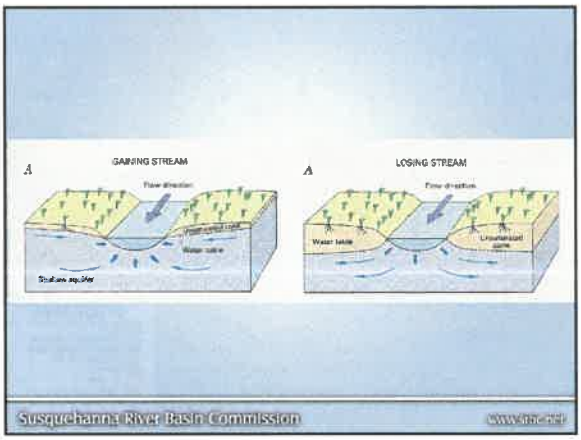

FLOW MONITORING STATIONS & PERCHED AND/OR LOSING STREAM REACHES
NORTHERN LANCASTER COUNTY GROUNDWATER STUDY
Flow Stations
Major River/Stream
Losing Stream Reach
Municipal Boundary
County Boundary
Study Area


GROUNDWATER WELL LOCATIONS AND YIELDS
WELL YIELDS
LITHOLOGY
Carbonate Study Area
Other Carbonate Area
Sandstone/Schist
Shale
Diabase
Gneiss


A
GAINING STREAM
A
LOSING STREAM
Water table
Susquehanna River Basin Commission
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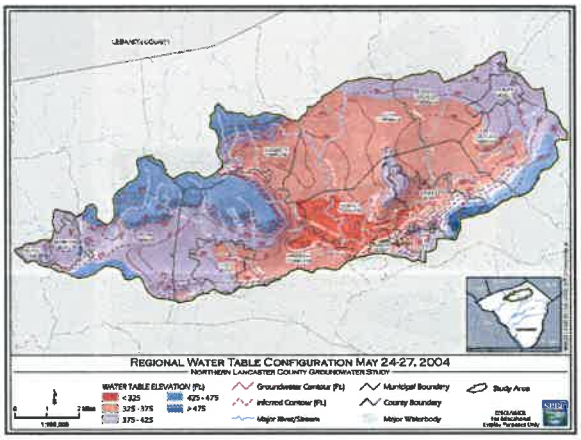
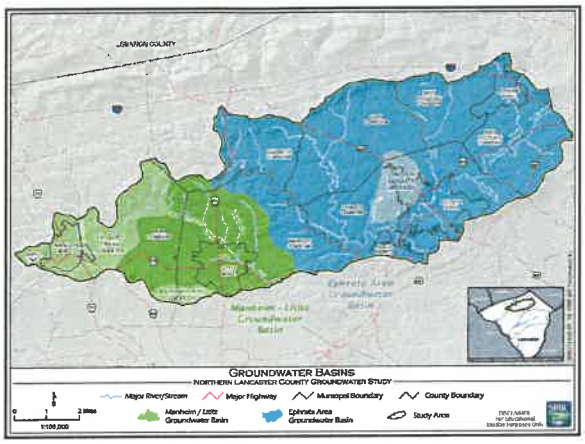

REGIONAL WATER TABLE CONFIGURATION MAY 24-27, 2004
NORTHERN LANCASTER COUNTY GROUNDWATER STUDY
WATER TABLE ELEVATION (Ft)
< 325
325 - 375
375 - 425
425 - 475
> 475
Groundwater Contour (Ft)
Inferred Contour (Ft)
Major River/Stream
Municipal Boundary
County Boundary
Major Waterbody
Study Area



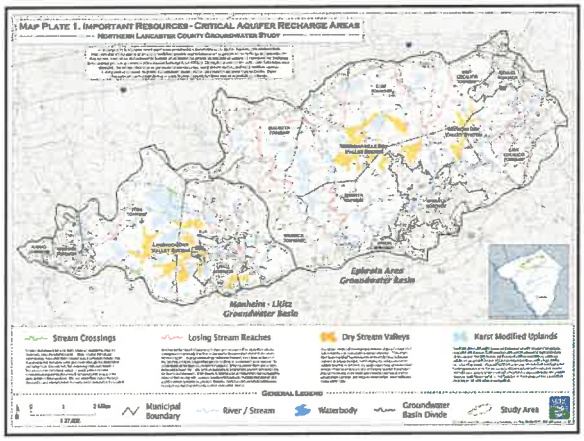
Critical Aquifer Recharge Areas

(CARA's) are areas that provide an exceptional amount of recharge, per unit area, to a local groundwater flow system.

Table 3. Average Annual Recharge for Selected Recurrence Intervals for Geologic Formations within the Study Area

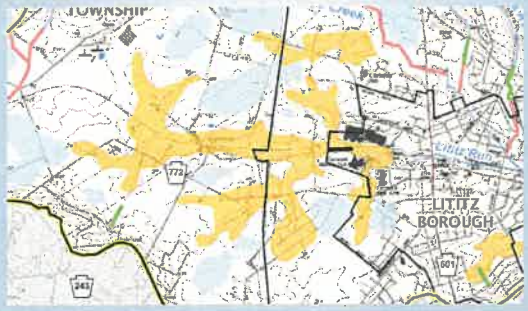
Map Symbol	Formation Name	1-in-2-Year Recharge[1] mgd/sqmi.	Unit Number[2]	Corrected 1-in-2-Year	1-in-10-Year	1-in-25-Year	Lithology
Oan	Annville	0.66	4	0.76	0.46	0.32	High-Calcium Limestone
Obu	Buffalo Springs[2]	0.53	6	0.61	0.37	0.26	Limestone
Oco	Cocalico	0.35	13	0.64	0.39	0.27	Shale
Os	Stonehenge	0.66	4	0.76	0.46	0.32	Limestone
Thc	Hammer Creek Conglomerate	0.39	19	0.45	0.27	0.19	Quartz conglomerate
Th	Hammer Creek	0.39	18	0.45	0.27	0.19	Sandstone
Ohm	Hershey and Myerstown, undivided	0.66	4	0.76	0.46	0.32	Argillaceous Limestone
Oha	Hershey through Annville, undivided	0.66	4	0.76	0.46	0.32	Argillaceous Limestone
Om	Millbach	0.34	7	0.39	0.24	0.25	Limestone
Tmc	New Oxford Conglomerate	0.40	21	0.46	0.28	0.19	Quartz Conglomerate
Oo	Ontelaunee	0.54	10	0.63	0.38	0.26	Dolomite
Or	Richland	0.55	9	0.61	0.37	0.26	Dolomite
Orb	Snitz Creek and Buffalo Springs, undivided	0.55	6	0.61	0.37	0.26	Limestone
Osc	Snitz Creek	0.53	6	0.61	0.37	0.26	Dolomite
Os	Stonehenge	0.87	1	1.01	0.61	0.42	Limestone

[1]after Gerhart and Lazorchick (1984b) Table 11
[2]after Gerhart and Lazorchick (1984b) Table 2

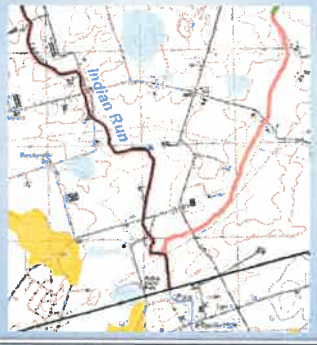


Parameter	Study Area	Ephrata GW Basin	Manheim-Lititz GW Basin
Area (sqmi)	70.2	48.4	21.8
1-in-10 (mgy)	10,608	7,077	3,531
Allocated Use	4,896	2,418	2,478
Total GW Use	2,990	1,497	1,493
% of 1-in-10 (Allocated)	46	34	70
% of 1-in-10 (Reported use in 2000)	28	21	42

CARA -- Dry Valleys



CARA -- Losing Stream Reaches



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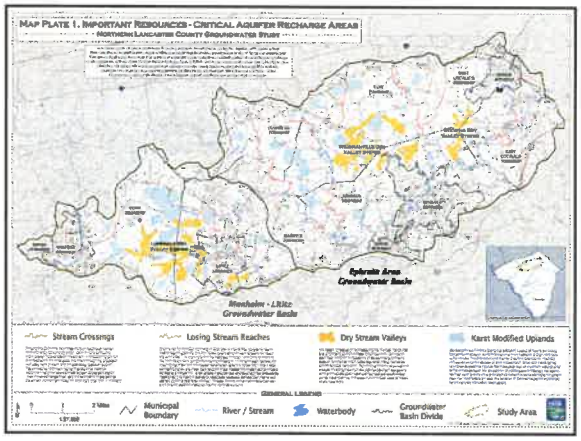

CARA -- Siliciclastic to Carbonate Stream Crossings

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Northern Lancaster County Groundwater Study

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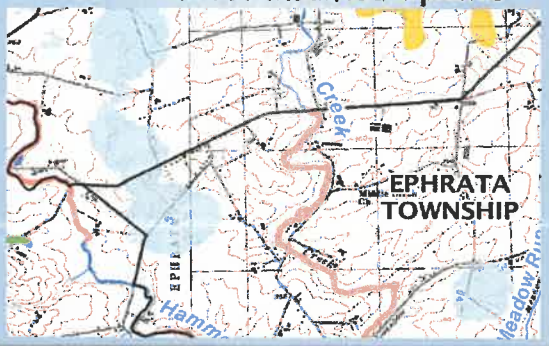
CARA -- Karst Modified Uplands



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