In the spring, the EPICA Board will begin a discussion of the Stormwater Problems in East Piney Island.

Below, you will find a Stormwater Report written in 2016 by Civil Engineer Louis Slade.

-STORMWATER REPORT-

Louis Slade
Washington D.C.

January 6, 2016

Arthur Gould
Piney Island
Chincoteague Virginia

Dear Arthur,

I've attached to this letter a short explanation about how rain water drainage works in a place like Piney Island. As you know, I'm a licensed Professional Engineer with over 40 years of experience in Civil Engineering analysis and design. Since the sale of my firm and my retirement, I've founded a Conservancy to restore an historic 27-acre woodland stream valley park that is part of Rock Creek Park in Washington D.C. One of the principal problems facing the restoration is the control of stormwater and its impact on water pollution and erosion. My key role in the conservancy is as chair of the restoration committee that is addressing solutions to the stormwater problem.

My family and I have visited Chincoteague at least once every year since 1976 mostly during the summer season and also in the fall and winter. We know Piney Island fairly well. You and I have walked around Piney Island on several recent occasions and I've seen how stormwater ponds in yards and on the roads after significant rainfall. I've based what I've written in the attachment on those observations and on my knowledge of surface and groundwater hydrology.

I hope this is helpful to you and your neighbors. I'll be happy to continue to discuss this with you and your committee.

Best regards,

Lou Slade

Stormwater Problems on Piney Island, Chincoteague, Virginia
By Lou Slade

As rainwater falls on roofs and other impermeable surfaces it typically drains off into yards and gardens. The runoff of rainwater on the surface of the yard will both percolate into the ground and also run off down slopes to a lower elevation. The rate of percolation into the soil depends on the soil type: water percolates quickly through sandy soil and at a much slower rate through clay soil.

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Once water has percolated into the ground it is referred to as groundwater. Groundwater continues to percolate downward to the "water table" which is the surface of the underground impoundment of groundwater. Impounded groundwater is the water that we tap and pump into our homes for domestic use.

The elevation of the water table gets higher after rainstorms. Between storms, groundwater continues to move slowly downward through the soil and it often also moves laterally. The lateral movement takes place when there is a nearby downward slope of the land like the side of a hill or valley, a streambank, a riverbank, etc. There, the groundwater will seep out of the hillside and typically will flow into the nearby waterway.

In developed areas such as Piney Island, the land surface should be sloped to get stormwater to flow away from buildings, roads and driveways. The surface runoff that doesn't percolate into the soil flows downhill to lower places and ultimately into a waterway. In some cases when it's not possible for the water to reach a natural waterway, it can be stored in a retention pond where over a longer period of time it percolates into the soil or evaporates or is used for irrigation in gardens and on lawns.

Stormwater that does not run off but instead percolates into the soil is typically not a problem, but in low lying areas frequent and large rainstorms can cause ground water levels to rise up to the ground surface. This leaves standing puddles of water which can take days to percolate or evaporate.

Perforated drain pipes can be installed below ground in a horizontal position with some slope. When the ground water table elevation reaches such a pipe, the water collects in the pipe and then flows down slope to a nearby waterway. In some case when there is not a way to carry the water away and into a nearby waterway, the water can remain in the pipe and ultimately can percolate into the soil below the pipe. This will only work however if the water table recedes downward to a level below the pipe.

Ditches can perform a similar function as below-grade drainpipes by collecting surface and groundwater. Rain water flows on the surface to the ditch. High levels of groundwater will also seep out into the ditch. The ditches on one or both sides of a road collect surface runoff from the road and from adjacent property. The road should be crowned so surface water on the road runs off into the adjacent ditch. The ditches will also lower the ground water under the road so that the road stays dryer.

Ideally, ditches have a longitudinal slope to carry the collected water away. In flat terrain this may not be possible, but the ditch can still be effective as a stormwater retention basin. Some homeowners plant water-loving vegetation in and adjacent to the ditch to create a landscape feature that is also a valuable habitat for wildlife.