

October 30, 2014

Below is a discussion of draft proposed changes to address surface water runoff management (stormwater runoff) for the 544-acre SCM Annexation Area.

Currently, Beaverton Engineering Design Manual requires the increased surface water runoff impacts from impervious surface create as result of development be mitigated by a “peak” standard detention facility approach that maintains post-development peak discharges at their pre-development levels. This approach addresses the concern of flooding, for which the “peak” discharge is the only important parameter, however, due to the increased volume and duration of flows that will occupy the natural receiving channel (creeks), increased channel erosion still is the result.

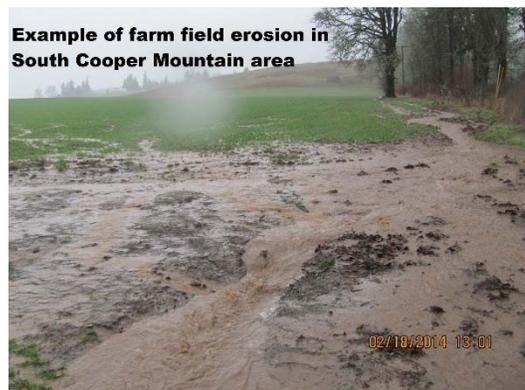
Mitigating the erosive potential of increased runoff requires control of the duration (not just the magnitude) of flows across a wide spectrum of sediment-transporting discharges within the natural receiving channel (creeks). Mitigating erosive potential requires reducing discharge below which sediment transport or any other disruptive conditions in the receiving channel occur. Many in the engineering community believe that only a combination of on-site **low impact development approaches** (LIDA) combined with larger end-of-pipe detention and surface water runoff treatment facilities will achieve the results of natural channel preservation while allowing site development.

The City of Beaverton has for the last several decades used a simple single-event design storm hydrologic model methodology (the SBUH method) for its “peak” standard detention facility approach. Interestingly this approach still results in the most restrictive standard for impervious area mitigation currently being applied by any jurisdiction in Washington County.

The current best available technology is a continuous simulation hydrologic model and such design tools are in wide use for development that take place in Western Washington. Such tools are more complicated to use and results yield substantially larger detention facilities which can increase initial capital costs for a development. Staff supports the application of a continuous simulation hydrologic model for development site design once it is adopted at the County-wide level – such adoption may take several more years to occur.

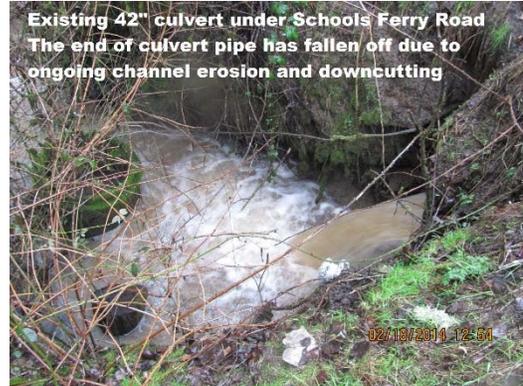
For the South Cooper Mountain development area the following things related to surface water management and the surface water runoff conveyance systems [creeks] are recognized.

- The surface water runoff conveyance systems already exist and in active use – this situation is unlike the case for sanitary sewer, potable water and other “dry utilities”.
- The surface water runoff conveyance systems are observed to currently experience channel changing disruptive flows (hydromodification).



The somewhat recent (prior to annexation) change from wooded condition to a crop/pasture land condition has substantially increased surface water runoff resulting in increased channel degradation.

- The soils in the area have limited ability to infiltrate large amounts of stormwater.
- The pending development applications appear to be for very large areas – which will effectively result in sub-regional approach(s) for surface water runoff management.
- There is appears to be no enforceable legal mandate to make any changes to the current surface water runoff management (stormwater runoff) design criteria to address hydromodification, but there does appear that many stakeholders are vocal in their request for changes and there may have been some implied promises.
- Any permits for work pursuant to “Standard Local Operating Procedures for Endangered Species to Administer Stream Restoration and Fish Passage Improvement Activities Authorized or Carried Out by the U.S. Army Corps of Engineers in the Oregon (SLOPES V Restoration)” will need to meet stormwater management standards that are much stricter. Such a permit may be required for work that impacts regulatory wetlands.



The following proposed changes are intended to be a simplified incremental change in the surface water management standards that will apply to the South Cooper Mountain development area until a county-wide approach is developed and implemented.

The intended results of the draft proposed changes are:

- No new surface water management computer software for the site designer to learn. The city is currently using a SBUH methodology and will continue to use this methodology.
- The assignment of wooded condition as pre-developed condition is intended to partly mitigate the current observed increased channel degradation of the area as well as to mitigate for the future increases in impervious area.
- The interception and capture of the first 0.20 inches of rainfall on a dry watershed is required wherever practicable and is disposed of via evaporation, transpiration, or infiltration. The interception of rainfall requirement is an incremental step toward achieving wider use of low impact development approaches in the site design as encouragement is not sufficient. The value of 0.20 inch in combination of presumptive performance of various application recognizes the low infiltration capacity of the areas soils while simplifying site design.
- The incremental increase in the surface water runoff treatment rate will roughly match the rainfall intensity observed by staff when street wash off of trash and debris occurs.

In summary:

The intent of this approach is to empower the private engineering community to use their creativity to craft a stormwater system design that fits well with marketable residential and commercial products as well as with the South Cooper Mountain Ecosystem.