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City of Yelm
Community Development Department
P.O. Box 479
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SUBJECT: Thurston Highlands Draft Environmental Impact Statement –
Review Comments

ATTENTION: Mr. Grant Beck, Development Services

Dear Mr. Beck:

The following are my comments on the above Draft Environmental Impact Statement (DEIS):

- **Watershed Alterations**
 - Stormwater generated by this project is proposed to be infiltrated into the site areas with good subgrade infiltration characteristics. These areas are coincident with areas identified in the DEIS as having essentially no aquitard between the surface and the Qva aquifer. As such, storm runoff will by-pass the traditional shallow groundwater aquifer (Qvr) and enter directly into the drinking water aquifer that serves numerous drinking water wells north of the project site (downstream). This introduction of runoff into the aquifer is very likely to degrade the water quality conditions in this presently pristine aquifer, altering the conditions permanently and irreparably. This potentially very adverse conditions has not been discussed at any length in the DEIS.
 - Stormwater runoff generated in areas not tributary to the Qva drinking water aquifer that is disposed of in areas tributary to the Qva aquifer constitute the transfer of water between drainage basins and alteration of the aquifer recharge conditions. This action has the potential of major broad area and long-term adverse impacts within the City of Yelm and Thurston County. This transfer of water between basins has not even been mentioned in the DEIS. Similar alternatives were discussed at the January 2006 meeting held by WSDOE in the aftermath of the severe Thompson Creek flooding of 2005/2006. It was determined that prior to any action being taken a Thompson Creek Water Conservation District should be formed to provide for regional planning of the Creek flood plain and tributary areas.
 - The DEIS clearly states that more than one half of the 40 inches of rainfall that falls as an annual average in the Yelm Area is lost to evaporation or

plant transpiration. The proposed development will reduce this rate of rainfall transfer directly to the atmosphere by more than 60% returning an additional 30% of the annual rainfall to be handled by the existing groundwater system and Thompson Creek as also stated in the DEIS. This change will irreversibly alter the local hydrology and will require large scale mitigation measures.

- The DEIS very clearly points out that the proposed development will change the flow characteristics of Thompson Creek in the form of creek stage and flood area. This change will adversely impact is downstream property owners by increasing inundation on their land without their permission and can not be legally justified. Proposed mitigation measures will not resolve or minimize this condition.
 - The DEIS lists retaining as much undisturbed/naturally vegetated area as possible to enhance evapo/transpiration as a mitigation measure. This not mitigation, but is maintenance of natural conditions which is a break even for the area considered for this application. It does not provide mitigation or improvement of condition changes that result as a result of the proposed development.
 - The DEIS mentions mitigation by retention/detention and off season release of collected runoff.
 - Thompson Creek is an intermittent seasonal creek, as accurately described in the DEIS. It is also accurately noted that the creek lies dry for most of the year. The release of retained/detained runoff would result in creek flow or recharge into the subgrade along the creek during the normal dry season. This will amount to intentionally changing the local and regional hydrology of the creek within the City of Yelm and Thurston County. As noted above this conditions was reviewed at the meeting with WSDOE and it was determined that 2005/2006 and 2006/2007 flood damage (downstream of Tahoma Terra and Thurston Highlands) and future creek maintenance and operation would require the formation of a local Water Resources Conservation District.
 - The DEIS describes mitigation via retention/detention with the infiltration of as much collected runoff as possible. Based on assessments of infiltration potential, the areas used will be relative close to Thompson Creek and into soil with relatively high infiltration rates. This combination will result in significantly reduced travel time of the infiltrated runoff within the shallow groundwater system. The DEIS states that the “Interflow Transmission Rate ranges from ft per day to ft per year.” Infiltrating runoff closer to the creek than naturally occurs at present will cause runoff to reach the creek days to years faster than at present, which will change the regional creek hydrology.

This change will result in less flow attenuation, higher creek stages and expanded creek flooding areas, hence damage to downstream property owners. As noted above this condition was discussed at the WSDOE meeting in 2006 with the resultant recommendation that a Water Resource Conservation District be formed.

- The DEIS describes mitigation via Improving the Creek Channel Hydraulic Characteristics. This alternative would require either dredging the creek on private property, mowing the creek channel on private property. Creek dredging to increase flow capacity would require major modification of the creek in Critical Areas Environments and is not permitted by City Ordinance, Thurston County, WSDOE and WSDF&W. Recently, a downstream farm was admonished by state agencies for this exact action. Mowing of the creek to improve channel hydraulics would involve the cooperation of downstream property owners and was discussed at the January 2006 post-flood WSDOE meeting with the ultimate determination that a Water Resource Conservation District needs to be formed to consider such issues and applications. This has not been undertaken to date.
 - The DEIS describes adding storage along Thompson Creek. Similar to the above item, this approach would require the alteration of the topography along Thompson Creek within Critical Areas, which is not permitted by City Ordinance, Thurston County, WSDOE and WSF&W. This approach was discussed at the January 2006 post-flood WSDOE meeting with the determination that a Water Resources Conservation District be formed. To date this District has not been formed.
 - The DEIS states that the most effective stormwater disposal approach (most nearly emulating the natural conditions at the site), near source retention and infiltration was not considered to be suitable for broad scale application for this project, as it would require the dedication of too much land from the development. The amount of land required to appropriately mitigate stormwater runoff disposal, adverse hydrologic and creek flow impacts should not be justification for not using the most suitable mitigation process. Mitigation in this case should consist nearly totally of near source retention and infiltration for disposal. This approach should be modeled in this DEIS and the results described.
- **Hydrologic/Hydraulic & Shallow Groundwater Modeling**
 - The DEIS describes and includes considerable technical information relating to subgrade infiltration of runoff, subgrade transmission of runoff and modeling of Thompson Creek stage and flood area. In reviewing the analyses performed, I find the following:
 - The modeling performed is noted to have been performed using rainfall data for Olympia Airport.

- In my own hydrologic studies performed within the City of Yelm, I have found that there are significant differences in the rainfall data collected in Olympia and Yelm. For example, the Olympia Gauge records average annual rainfall to be about 53 inches, while Yelm records (as is stated in the DEIS) 40 inches per year.
 - The City of Yelm measures and records daily rainfall at the City Wastewater Treatment Plant, which is the most representative data for the Yelm Area.
 - Comparison of daily rainfall at the Olympia gauge site and Yelm gauge site shows significant differences in rainfall patterns and amounts.
 - The fact that City of Yelm rainfall data has not been used to perform the analyses and studies introduces significant inaccuracies into this delicate process.
- Thompson Creek Hydrologic, Hydraulic and Shallow Groundwater modeling as described in the DEIS has been performed using generalized area hydrology, groundwater flow considerations developed for the McAllister Springs Watershed (City of Lacey) and Thompson Creek flow monitoring performed above and below the Tahoma Terra Bridge from 29 December 2007 through 06 March 2008. Hindcast hydrologic performance parameters from these 2 months of data were applied to Olympia Airport rainfall data to calculate/estimate Thompson Creek flood depth and flood area performance for 1981 and 1997 rainfall data.
 - Again Olympia gauge rainfall data was used not Yelm data.
 - Performance of an estimated average rainfall year and an extreme rainfall year was calculated/estimated from 2 months of flow data collected upstream and downstream of a significant creek flow restriction, which is not a bridge, but a grouping of culvert sections set in the creek flow channel above two significant hydraulic restrictions, the Berry Valley Road culvert and the 93rd Avenue culvert. These culverts were discussed extensively during the January 2006 post-flooding meeting at WSDOE. As such, the hydraulic performance predicted is highly suspect with respect to accuracy and general representation of creek performance.
 - The Thompson Creek tributary basin, per the DEIS and personal research is highly dependent on antecedent rainfall/groundwater recharge conditions. The analyses performed and use of the 2 months of data does not describe having taken into account the 03/04 December 2007 storm that in some areas of Thurston County and Mason County was nearly 100 year/24 hour rainfall events. This event would have had the impact of providing early and extensive recharge of the shallow groundwater system during the stream flow data collection period raising the creek flow rates and stages above the levels that would have been representative for the 29 Dec 2007 to 0 6 March 2008 collected data. As such, the analyses performed would appear to strongly favor an over

estimation of monitoring period flows and stages and under estimation of the 1981 and 1997 calculated/estimated values.

- Subsequent to the January 2006 post-flood WSDOE meeting a program to monitor the flow in Thompson Creek was initiated by Thurston County at the 93rd Avenue culvert. Monitoring equipment was in place during the 2007/2008 wet season. The data collected for this near by monitoring site has not been mentioned or included in the analyses described in the DEIS. These data should be incorporated into the DEIS analyses.
 - It is noted that the Thompson Creek hydrology has been significantly altered by City of Yelm development approvals in the past, specifically the closure of the two WSDOT culverts under SR507 described in the JWMA reference relating to the Ridgeline Trough. The real headwaters of Thompson Creek originally were located well south of SR507. This process should consider this fact and seek to reestablish the pre-1999 hydrologic and hydraulic conditions of the upper Thompson Creek drainway, which included a surface flow path across the Nisqually Valley Golf Course.
- **Road & Building Slope Setbacks**
 - The Earth Section of the DEIS states that road and building set backs will be established to be equal to the slope height. This criterion is reasonable and should be adopted as the minimum condition to be adjusted upward if necessary based on the slope configuration and soil make up.
 - **Infiltration Information**
 - Figure 3.1.4 Test Pit Locations and Infiltration Rates is noted as presenting infiltration rates in its title and in the DEIS text. The included figure does not show infiltration information of any sort. This figure should be reissued in a revised version of this DEIS.
 - **Reclaimed Wastewater**
 - The DEIS proposes the disposal of 1.5 million gallons of reclaimed wastewater, which is about 2 times the amount of wastewater that would be generated by the full build out of the Thurston Highlands development. This means that about 50% of the reclaimed wastewater would be imported from other areas of the City of Yelm.
 - This water would be transferred from the area of generation, which in large part would be the Yelm Creek Drainage Basin to the Thompson Creek Drainage Basin. Transfer of water from one basin to another has serious repercussions.
 - It changes the hydrology of both the basin it is withdrawn from and the basin it is transported to.
 - It changes the water balance in both basins, impacting water rights.
 - Neither of these issues have been raised or discussed in the DEIS. As this is a major environmental impact item, it should be included in this study.

- This water would add to the already highly charged hydrologic environment in the Thompson Creek basin. The amount of wastewater proposed for disposal in the Thurston Highlands basin amounts to a constant flow of 2.3 cfs into infiltration areas that will be located relatively close to Thompson Creek and per the DEIS will raise the flow rate and stage of the creek. This water would be contributed to the creek 365 day per year, even during the annual dry season when this intermittent seasonal creek does not flow for 6 to 11 months of the year. As such, this addition of a constant wastewater stream to the creek basin would change the creek hydrology and flow patterns, and even the natural vegetation in the area downstream from the disposal point. This regional change of hydrology is a major issue for downstream/Thurston County property owners. This item is strongly related to all of the issues raised at the January 2006 post-flood WSDOE meeting and is grounds for the formation of a Thompson Creek Water Conservation District.
 - The reclaimed wastewater that is proposed for disposal within the project area generally meets present drinking water standards. However, the present standards are being legally challenged with regard to the level of treatment and appropriate of disposal into active drinking water aquifers. Present wastewater treatment processes do not remove all pathogens from the treated stream and do not remove pharmaceuticals from the wastewater stream. The lack of a suitable aquitard within the project site will introduce the wastewater stream into the local drinking water aquifer in close proximity to numerous private water wells that have been in use for many years, compromising their water quality with regard to organism introduction and medication introduction. No consideration is given to these items in this DEIS.
 - At present the City of Yelm reintroduces reclaimed wastewater into the shallow groundwater system via a surface pond system at Cochrane Park in the center of the City. The infiltrated wastewater enters the aquifer in an area where there is no direct contact with the lower drinking water aquifer. Additionally, there are not drinking water wells within about 1 mile of the ponds. This application is performed within the City of Yelm and essentially impacts the City of Yelm. In this case, the introduction area has no to limited aquitard and will introduce wastewater into the drinking water aquifer within less than ½ mile of numerous private well sites and into the aquifer that they draw from. This condition has not been presented or discussed in this DEIS.
- **DEIS Document Length & Complexity**
 - It is noted that Washington State RCW's state that the EIS should be no longer than 150 pages. I applaud the authors for attempting to cover such

a large project in a single document and increasing its size to 350 pages to accommodate the Public Information intent of this process. I request that either the project be broken up in to more tractable portions allowing adherence to the RCW requirement of 150 pages or an additional 1 month of review time be provided to allow the more complete study of this extensive and complex document.

- **Thompson Creek Water Conservation District**
 - Many of the hydrologic, hydraulic, shallow groundwater and deep groundwater issues that have been raised in the preceding paragraphs relate back to items discussed at length at the 28 January 2006 post-flood WSDOE meeting. I request that the meeting conclusion that a Thompson Creek Water Conservation District be formed to develop a comprehensive basin/drainway plan prior to the performance of further study or City consideration of this development proposal so that coordinated (City and County) planning can be performed for the Thompson Creek area that will provide adequate representation of all of the stakeholders of the Thompson Creek environment.

Yours truly,

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