WASHINGTON STATE DEPARTMENT OF ECOLOGY

TO: DAN SWENSON

FROM: DOUG WOOD

SUBJECT: INVESTIGATION - CELP COMPLAINT DATED AUGUST 29, 2007 REGARDING SEATTLE JOINT TRAINING FACILITY (JTF)

DATE: SEPTEMBER 20, 2007

CC: JEANNIE SUMMERHAYS

BACKGROUND

On August 30, 2007 the NW Regional Office of the Water Resources Program received a letter from The Center for Environmental Law and Policy (CELP) regarding an alleged unauthorized beneficial use of water by the City of Seattle at a site located in South Seattle near White Center. The site is being developed by the City of Seattle as a training center for city and other regional firefighters and is referred to as the Joint Training Facility (JTF).

The JTF site is a former gravel pit where mining has removed several hundred feet of material leaving an east sloping grade overlooking the Lower Duwamish alluvial plain.

CELP in its letter states that the site lies within the Hamm Creek watershed and that proposed wetland mitigation will divert waters that would otherwise supply flows to Hamm Creek and may lead to dewatering of the creek. CELP further states that water use for the project constitutes a beneficial use of water that requires permitting under the Water Code.

CELP subsequently informed Ecology that it is aware that the JTF site and the area of nearby wetlands are not part of the Hamm Creek drainage.

INVESTIGATIVE METHODS AND DATA SOURCES

The investigation of the CELP complaint was intended to address the two issues raised; first the hydrology of the site and surrounding area was examined, and second the nature of project was reviewed to determine whether the intended use of water required permitting under the Water Code.

The surface water hydrology of the site and surrounding area were investigated using maps supplied AMEC (environmental consultants for the JTF project), USGS topographic maps, LIDAR data obtained from the Puget Sound LIDAR Consortium and King County, and GIS data produced by King County.

Topographic contours were used to determine the direction of surface water flow. Contours form "V" shapes along stream channels that can be traced from higher to lower elevations. In the present investigation contours derived in 1949 from 1940's air photographs and one derived from modern LIDAR digital elevation data were examined to determine the direction of surface water flow.

AMEC environmental consultants performed a field analysis of site drainage which was reported in a technical memo dated February 7, 2007 (Attachment B). The AMEC study tracked colored markers through the JTF site and municipal drainage facilities.

Scanned and georeferenced topographic maps and the AMEC maps of site drainage were incorporated into a GIS database so that comparisons could be made of past and current site topography and drainage direction could be traced using topographic contours.

The water resources policy aspects of the CELP letter were investigated through a review of the Water Code and consultations with Water Resources colleagues and Ecology advisors with the Attorney General's office.

FINDINGS

Hydrological Analysis

An evaluation of topographic maps with base contours of the site dating from 1949 (Figure 1; after Bartleson, et al., 1980) show that gullies draining the site area are directed to the northeast toward a separate drainage basin, not connected to the Hamm Creek sub-basin. This creek, referred to as Durham Creek in water right documents relevant to the site, once joined the Duwamish River at a point about 1.5 miles north of the present JTF site near where Hwy 99 and 509 now intersect. This stream is mimicked today by the drain system which AMEC, environmental consultants for the JTF site, have shown to be the path of flow for water drainage from the site (Attachment 2).

Figure 1 shows the original course of the Duwamish River as well as the course of Hamm Creek prior to the construction of the Duwamish Waterway. This map shows that there were two forks of Hamm Creek, a south fork that originates from the Des Moines Upland in an area approximately 1.25 miles ESE of the JTF site and a north fork that originates from a gully located approximately 1/2 mile SSE of the current JTF site. The North Fork of Hamm Creek flowed northward off of the upland and drained into a wetland, since drained, that existed in an area now occupied by an exit cloverleaf of Hwy 99. This wetland flowed eastward to join with the South Fork of Hamm Creek approximately 1/8 of a mile upstream of where Hamm Creek historically entered the Duwamish River.

LIDAR derived topographic contours of the JTF site (Figure 3) show that modern surface water drainage from the JTF site flows in substantially the same direction they were in the 1940's, when gravel operations were much less extensive (Figure 2). A drainage divide that can be inferred from the shape of both the 1949 topographic contours and those derived from LIDAR data (Figure 3).

Drainage divides derived from 10-meter (30 foot) Digital Elevation Models (DEMs) by King County DNR (Figure 2) indicate that the divide between the North Fork of Hamm Creek and Durham Creek is located about 1/8th mile further north so that a portion of the former gravel pit would drain to the North Fork of Hamm Creek. LIDAR derived topography, which provides a resolution 6 feet, is more detailed and does not support inclusion of the south portion of the gravel pit within the North Fork drainage.

Surficial geological mapping of the JTF site area as published in 2005 by the USGS (Figure 4) confirms that JTF site drainage is to the northeast toward the drainage basin of Durham Creek, rather than to the North Fork of Hamm Creek.

Surficial geology (Figure 4) indicates that groundwater flow through and from the gravel pit travels in a northeasterly direction. Groundwater flow likely contributes to seeps and possibly springs where it encounters low permeability layers immediately west of the current trace of Hwy 509, where they would be directed into stormwater drains that are un-related to the Hamm Creek drainage system.

Mining of gravel at the JTF site has altered the natural flow of groundwater (Figure 5). It is unlikely however that flow direction or the quantities have greatly changed. The most likely consequence of lowering the surface elevation in the pit would be to cause a general lowering of the water table to below the current surface with an accompanying loss of groundwater storage. The removal of the low permeability till layer that likely originally covered the pit area has probably resulted in greater recharge of the underlying water table in the pit area.

Groundwater flow emanating from the former gravel pit area enters the alluvial plain of the Duwamish River as either surface flow from springs and seeps along the valley margin or as groundwater that enters the Duwamish alluvial aquifer.

The Duwamish valley alluvial aquifer flows in a northerly direction from where groundwater from the site area likely enters. It is unlikely that groundwater from this area could migrate the approximate ½ mile distance eastward where groundwater within the alluvial aquifer likely supports base flows in the lower-most reaches of Hamm Creek. Groundwater flow originating from the southern end of the former gravel pit (not part of the JTF site) may in part commingle with groundwater that supports base flows near where the North Fork of Hamm Creek enters the Duwamish valley.

Wetlands associated with open drainage ditches located within the Duwamish Alluvial plain approximately 1/4 east of the JTF site are supplied by groundwater within the Duwamish alluvial aquifer and by surface water runoff from the upland area where the JTF site is located. These ditches are part of the drainage system that was constructed to reclaim this area for industrial development. They currently represent the last surface water bodies associated with Durham Creek.

Site Inspection

The JTF site was visited on September 5, 2007. The field examination confirmed that the existing wetlands are part of a site drainage system rather than of a natural surface water flow regime. The wetlands on the site are associated with the two site drainage systems, a North Drainage and a South Drainage.

The North Drainage originates at the base of the former gravel pit west wall from a drainage trench. Flow from the trench is directed through a pipe to a man-made ditch on the northern periphery of the site. Off site the North Drainage is directed to the Highway 509 storm drainage system. It is not clear from the AMEC drainage report where the Highway 509 drainage system directs its flows, but topography and the route of the road indicate it would discharge to the Duwamish Waterway near where Durham Creek originally entered the Duwamish River (Figure 1).

North Drainage flow is currently redirected around areas where riparian and wetland improvements are being completed as part of a wetlands mitigation permit issued by USACE (the diversion is approved through an HPA). Once site work is completed the flow will be returned its current configuration.

The South Drainage begins in the south east portion of the JTF site at a shallow (approx. 10 feet deep) stormwater detention pond that was classified by the USACE as wetland. The base of the stormwater retention pond appears to penetrate below the water table and is likely to have standing water during most if not all of any year (cattails are present in the deepest portion of the feature). The pond is currently connected by submerged pipe to a drain adjacent to the roadside swale on the west margin of Myers Way. The overflow from the drain is to the roadside swale.

Site design plans show that the South Drainage, upon completion, will contain surface water flow from paved areas and roof tops constructed on the site. In addition the South Drainage is designed to channel groundwater seepage from beneath the site. As part of the wetland mitigation under the USACE approved plan, this stormwater retention pond is being expanded and a portion of the runoff (approximately 35 gallons per minute) directed to a swale located adjacent to the JTF site along the west side of Myers Way. The swale is connected to the drainage described above for the North Drainage System.

Water Code Review

In Washington State the diversion and beneficial use of waters of the State is subject to regulation under Chapter 90.03 RCW. One of the concerns raised by CELP in its letter of August 29, 2007, is that water at the JTF directed to site wetlands constitutes a beneficial use requiring a permit under RCW 90.03.250.

In order to determine whether the proposed diversion will result in a beneficial use of water, a description and an explanation of the purpose of the facilities are required.

The proposed wetland mitigation plan at the JTF site is intended to replace wetlands that were impacted by site development. The plan was devised to satisfy the requirements of an agreed settlement with the US Army Corp of Engineers (USACE). There is no intention to develop new wetlands.

Prior to recent site development, wetlands on the JTF site were a result of two processes - stormwater drainage facilities and shallow groundwater flow. The preexisting stormwater management and drainage system on the site in part consists of a retention pond, a drainage ditch, a surface channel and buried pipes that convey water to points off site where it then enters the regional storm drainage system.

The preexisting site drainage facilities were constructed as part of the decommissioning of the mine site as required under a mine reclamation permit issued by the Washington Department of Natural Resources (DNR). The DNR reclamation permit, a Type 70 permit (#10167) issued under the authority of Chapter 77.44 RCW, requires that the site owner manage stormwater flow and groundwater seepage from the former open pit gravel mine site in order to accommodate future land uses. While clearly not the intended goal of the mine reclamation process, wetlands on the site developed as a consequence of poor system performance, rather than as the intended outcome.

A similar set of circumstances arose a few years ago during construction of the third runway at the SeaTac airport. In that case stormwater drainage was managed to provide mitigation for the impacts of construction on the flows of local creeks through releasing stormwater stored in underground vaults at times when affected surface water bodies were at low flow conditions.

The issue of a regulatory requirement for a water permit for incidental uses that are part of stormwater management system was the subject of litigation at the Pollution Control Hearings Board (PCHB 01-160) and before the Supreme Court of Washington (151 wn.2, 586).

The PCHB found that water from stormwater released during low flow periods to the affected drainage constituted a beneficial use of water requiring a water right permit since it served to enhance the environmental conditions of the affected creeks. The Supreme Court reversed this finding and determined that stormwater management does not constitute a beneficial use of water so long as flow is retained within its original hydrological system.

CONCLUSIONS

An investigation of available evidence, including modern and historical topographic, geological and hydrological material indicates that surface and groundwater flows originating at the JTF site are not hydraulically connected with base flows of Hamm Creek, but with a separate drainage system referred to in Ecology records as Durham Creek, which prior to the construction of the Duwamish Waterway entered the estuary of the Duwamish River about 1.5 miles north of the JTF site.

Groundwater emanating from the southern extremity of the gravel pit site, located south of the JTF site, may co-mingle with groundwater connected with the North Fork of Hamm Creek.

The topography of the JTF site indicates that site drainage, as currently configured and as proposed upon site completion, follows closely the pre-development drainage flow pathways. Keeping in mind that the site and Duwamish Valley have been extensively altered during the past 100 years, the two drainage paths (North Drainage and South Drainage) approximate the hydrology of the site prior to site development (Figure 6).

The observed site conditions support a conclusion that the existing wetlands are a consequence of site drainage facilities that were constructed as a requirement of the site reclamation permit issued by DNR when mining ceased. While it is not likely that wetlands on the site were intentionally created as part of the reclamation plan, their existence is a product of the performance of the drainage system completed as part of that plan.

Upon completion of the JTF facility, drainage at the site will be in part redirected within the same flow regime and utilized as part of an USACE approved mitigation plan. Water flow at the completed site will remain part of a site drainage management system. It does not appear that the proposed mitigation plan envisions creating more wetlands than were previously associated with the site.

The current and proposed water facilities and associated wetlands at the JTF site are intended to manage water flow from the site. These facilities are mandated under water quality and mine reclamation permits that are applicable to the site.

JTF site wetlands are secondary consequence rather than the primary purpose of these water management systems, the proposed mitigation plan will not add new wetlands, and the flow regime of the site drainage system essentially mimics the hydrology of the site, as closely as is practicable, to what existed prior to development. These facts indicate that the proposed diversion of drainage at the JTF site under its wetland mitigation plan do not constitute a beneficial use requiring a water right permit.

Analysis and conclusions herein are not intended to address compliance or regulatory issues related to wetlands, stormwater permitting, or mine reclamation, but are limited to the hydrology of the water flow and to water rights permitting requirements.

References Cited

Bortleson, G.C., Chrzastowski, M.J., and Helgerson, A.K. (1980) – Historical Changes of Shoreline and Wetland at Duwamish River and Elliot Bay, Washington; USGS Hydrologic Investigation Atlas HA-617 (Sheet 7).

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King County iMAP (2007) – An interactive website provided by King County government that allows display of GIS data created and/or maintained by various county agencies. (http://www.metrokc.gov/gis/Mapportal/iMAP_main.htm)

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Water Right Files for Surface Water Certificate 1062 (1937) – Department of Ecology Water Right Tracking System (WRTS) database and document archival system records for surface water rights issued to Mutual Materials Company for 1.0 cubic feet per second to serve sand mining and irrigation purposes.