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SLR

January 17, 2012
Project 101.00855.00001

Mr. Russ Olsen
Washington Department of Ecology
3190 – 160th Avenue SE
Bellevue, Washington 98008

Re: Closure of Continental Fuel Hydrant System, SeaTac International Airport

Dear Mr. Olsen:

On behalf of Continental Airlines, Inc. (Continental), SLR International Corp (SLR) has prepared this letter to document the recent closure of the inactive Continental fuel hydrant system at SeaTac International Airport. The fuel hydrant system had not been operated since 1991; however, during an inspection of the inactive system components by the Washington Department of Ecology (Ecology) and the Port of Seattle (Port) in May 2011, it was discovered that the system had not been properly closed. The inspection was part of an Ecology five-year review of the environmental conditions at the fuel hydrant system site.

After being informed that the fuel hydrant system had not been properly closed, Continental contracted SLR to close the system in accordance with Ecology and Port requirements. This report presents general information about the fuel hydrant system, a summary of the previous environmental investigations at the hydrant system site, and a description of the system closure activities.

General Information About Continental Fuel Hydrant System

The former Continental fuel farm was installed in 1973 by Chevron U.S.A. (Chevron), and was operated by Crawford Aviation (under contract to Continental). The fuel farm consisted of four, 40,000-gallon underground storage tanks (USTs). The tanks supplied Jet A fuel to an underground hydrant pipeline that was approximately 4,100 feet long. The pipeline, which consists of a 6- to 16-inch-diameter steel pipe, ran from the former fuel farm area to the northwest, around the north end of the North Satellite Terminal, and then south to 16 fuel hydrant valve pits located along the north and west sides of Concourse C. The locations of the former Continental fuel farm and the fuel hydrant system are shown on Figures 1 and 2. Each hydrant valve pit, which contains a hydrant valve, consists of an approximate two-foot-diameter steel cylinder that extends from ground surface to

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approximately three feet below ground surface (bgs). The pipeline also contained three high point vents and two low point drains.

The USTs at the Continental fuel farm were taken out of service in 1991, and the tanks were removed in 1992. During the tank decommissioning, the fuel hydrant line was drained and then capped at the fuel farm (ENSR Consulting and Engineering [ENSR], 1992).

Previous Environmental Investigation Results

In 1994, ENSR conducted a subsurface investigation along the inactive Continental fuel hydrant system to assess the potential presence of petroleum hydrocarbons in the soil. The investigation consisted of drilling and sampling 61 soil borings to depths of approximately 10 to 15 feet bgs. The borings were spaced at approximate 100-foot intervals along the pipeline and were also located adjacent to all of the hydrant pits, high point vents, low point drains, and hydrant line junctions. The approximate locations of the borings are shown on Figure 3. A minimum of two soil samples were collected from each boring for analysis of total petroleum hydrocarbons (TPH) as Jet A fuel. The majority of the soil samples that contained TPH as Jet A concentrations greater than the Model Toxics Control Act (MTCA) Method A soil cleanup level were collected at locations adjacent to hydrant pits, high point vents, and low point drains. The impacted soil primarily occurred at depths between 5 and 10 feet bgs, and in several borings, the TPH as Jet A concentrations decreased significantly to near or below the Method A cleanup level by 15 feet bgs (ENSR, 1994).

In 1999, Foster Wheeler Environmental Corporation (Foster Wheeler) conducted a subsurface investigation along the inactive Continental fuel hydrant system to further characterize the vertical extent of the TPH as Jet A concentrations in the soil, and to determine if the petroleum hydrocarbons reached the groundwater. The investigation consisted of drilling and sampling 13 soil borings at locations of known impacted soil. The approximate locations of the borings are shown on Figure 3. The borings were advanced to depths ranging from approximately 20 to 45 feet bgs, and the soil sample analytical results showed that the impacted soil did not reach the groundwater table (Foster Wheeler, 1999). The shallowest groundwater (the Qva aquifer) beneath the hydrant system occurs at a depth of approximately 90 feet bgs.

In November 1999, Continental entered into Ecology's Voluntary Cleanup Program and requested that Ecology issue a "no further action" (NFA) opinion for the Continental fuel hydrant system site. Ecology responded that they were prepared to issue an NFA opinion, provided that a restrictive covenant was filed with the King County Assessor's or Recorder's office (Ecology, 2000). In November 2002, Continental submitted the Port's

airport operational area institutional controls to Ecology (Perkins Coie, 2002), and in October 2003, Ecology issued an NFA opinion for the hydrant system site (Ecology, 2003).

Closure of Fuel Hydrant System

When Ecology and the Port briefly inspected the inactive Continental fuel hydrant system, they observed that the hydrant valve pits were not filled with concrete, and that the hydrant valves were still present in the remaining pits. To determine the scope of work associated with the system closure, SLR thoroughly inspected the system components in October 2011, and discovered that portions of the system had been removed since the subsurface investigation activities in 1999. As part of pavement replacement projects or airport construction projects, the Port removed three sections of the Continental fuel hydrant line, including a high point vent, a low point drain, and the southernmost hydrant valve pit (designated Pit #1). Two of the removed sections of the pipeline were less than 60 feet long; however, to the northeast of the North Satellite Terminal, a 750-foot-long section of the pipeline was removed. The approximate locations of the removed sections of the fuel hydrant system are shown on Figure 2. According to Mr. Paul Agid of the Port, any fuel would have been drained from the pipeline prior to the removal activities, and after removal, the ends of the remaining pipe would have been capped in accordance with their pipeline removal protocols (personal communication with Mike Staton of SLR on December 5, 2011).

Based on the hydrant system inspection in October 2011, the remaining 15 fuel hydrant valve pits (designated Pit #2 through Pit #16) still contained valves and were not filled with concrete, and the remaining high point vents and low point drain were capped, but the pits that housed the vents and drain were not filled with concrete. To close the fuel hydrant system, the hydrant valve was removed and the pipeline was capped at each remaining valve pit, and the valve pits and the pits that housed the remaining high point vents and low point drain were filled with concrete. The system closure activities were conducted on November 14, 15, and 16, 2011. To minimize impacts to the airport operations, the work was conducted between 7:00 p.m. and 6:00 a.m. A description of the closure activities is presented below, and photographs of the closure activities are attached.

Drain and Inert Fuel Hydrant Line

Prior to removing the hydrant valves, Marine Vacuum, Inc. (MarVac) of Seattle, Washington, removed the cap at the low point drain and used a vacuum pump to extract any remaining fuel in the western part of the hydrant system. A total of 10 gallons of water were pumped from the line, and no fuel was present. The water was hauled off-site

for disposal at the MarVac facility in Seattle. After the removal of the water, Sound Testing, Inc. (Sound Testing) of Seattle, Washington, pumped carbon dioxide into the hydrant line to inert the system.

Cap and Close the System

After Sound Testing certified that any remaining petroleum vapor concentrations in the hydrant system were below the lower explosion limit, then Wyser Construction, Inc. (Wyser) of Snohomish, Washington, removed the valve at each hydrant valve pit and bolted a cast iron cap on the remaining pipe flange. At the high point vents and the low point drain, bolted caps were already in place. After installing the caps, Wyser filled each hydrant valve pit, high point vent pit, and low point drain pit with concrete, and then covered the concrete-filled pits with the existing steel lids.

Conclusions

Based on the recent system closure activities and the previous system closure and pipeline removal work, the Continental fuel hydrant system has been properly abandoned. SLR believes that no further action is necessary regarding the fuel hydrant system.

If you have any questions or require any additional information, please contact me at (425) 471-0479.

Sincerely,

SLR International Corp

Michael D. Staton, L.G.
Principal Geologist

Attachments: Limitations
References
Figures 1, 2, and 3
Project Photographs

cc: Dan Tisoncik, United Airlines
Paul Agid, Port of Seattle

LIMITATIONS

The services reflected in this report were performed consistent with generally accepted professional consulting principals and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This information is solely for the use of our client unless otherwise noted. Any reliance on this information by a third party is at such party's sole risk.

Opinions and recommendations contained herein apply to conditions existing when services were performed and are intended only for the client, purposes, location, timeframes, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

REFERENCES

ENSR Consulting and Engineering. 1992. *Underground Storage Tank Closure Report and Site Assessment for the Continental Fuel Storage Facility at Seattle-Tacoma International Airport in Seattle, Washington.* December.

ENSR Consulting and Engineering. 1994. *Site Assessment for Jet Fuel Hydrant System at SeaTac International Airport, Seattle, Washington.* July.

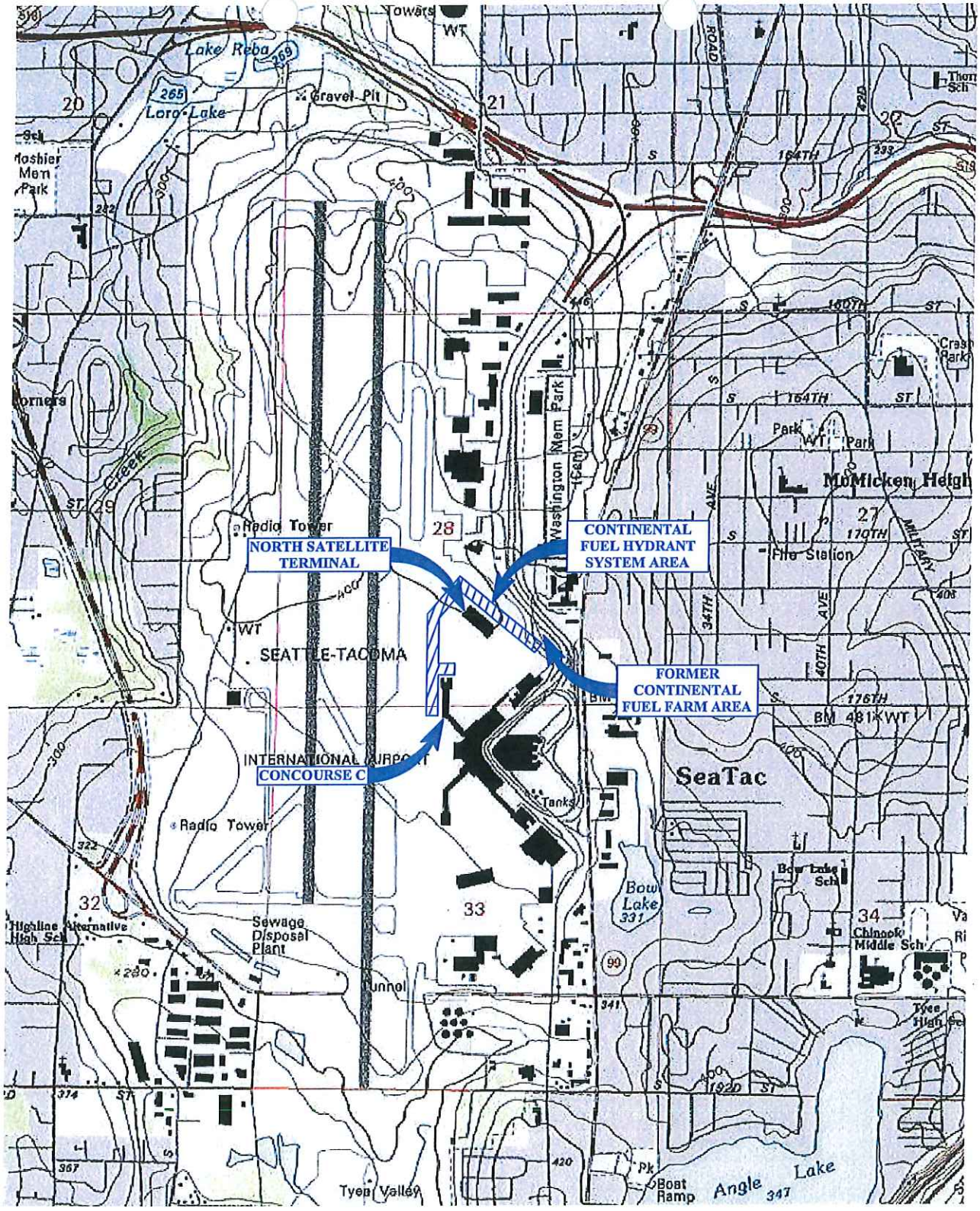
Foster Wheeler Environmental Corporation. 1999. *Fuel Hydrant System Investigation Report, SeaTac International Airport, Seattle, Washington.* September.

Perkins Coie. 2002. Letter to Mr. Joe Hickey of Department of Ecology. November 25.

Washington Department of Ecology. 2000. Letter to Mr. Ronald Schultz of Continental Airlines. April 10.

Washington Department of Ecology. 2003. Letter to Ms. Anna Schmidt of Continental Airlines. October 10.

FIGURES



Base map prepared from USGS 7.5-minute quadrangle of DES MOINES,WA (1995)

0 2000 4000

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FIGURE 1

CONTINENTAL FUEL HYDRANT SYSTEM
SEATAC INTERNATIONAL AIRPORT

LOCATIONS OF INACTIVE CONTINENTAL FUEL HYDRANT SYSTEM AND FORMER CONTINENTAL FUEL FARM

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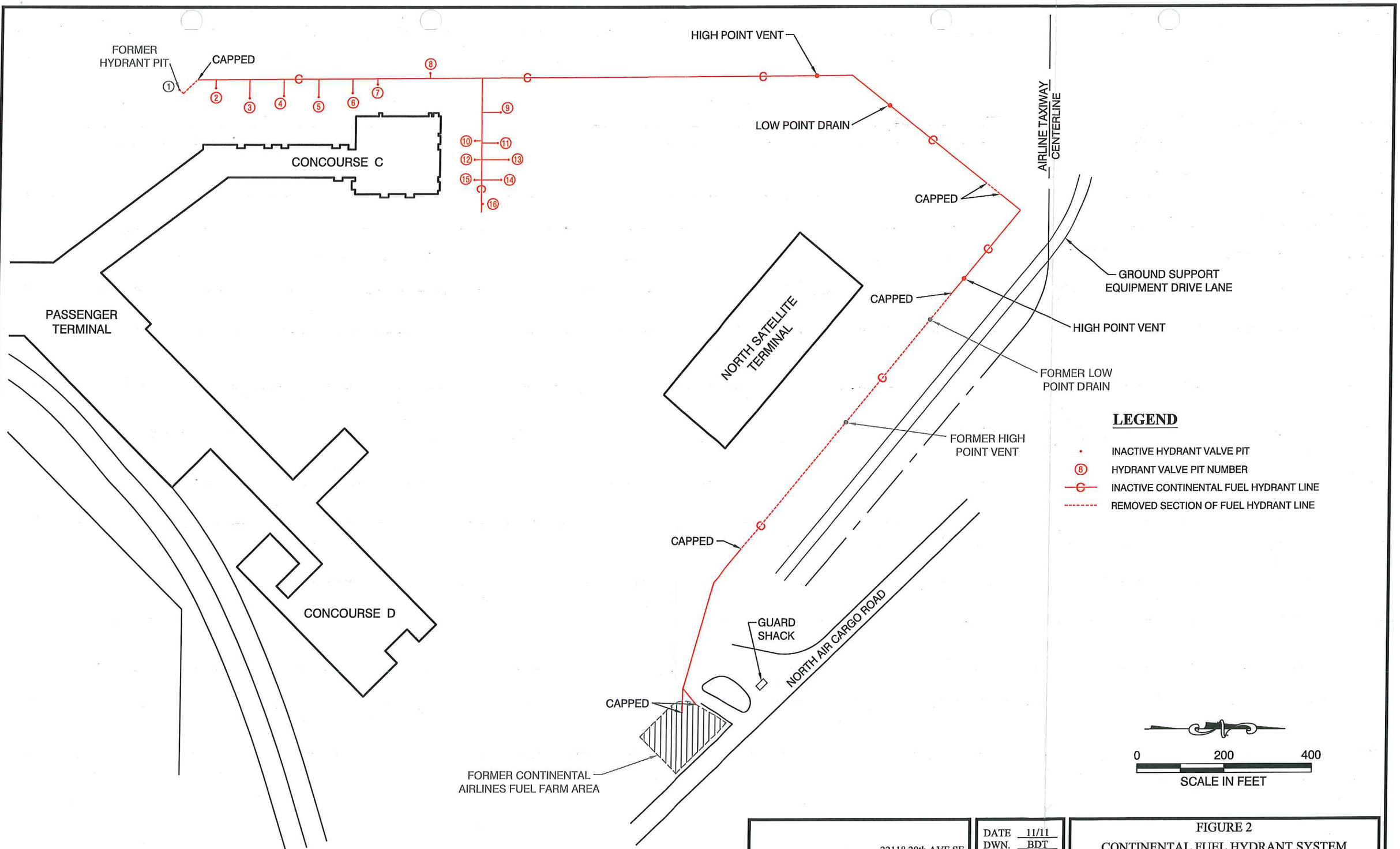

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FIGURE 2

CONTINENTAL FUEL HYDRANT SYSTEM
SEATAC INTERNATIONAL AIRPORT

LOCATION OF INACTIVE CONTINENTAL FUEL HYDRANT SYSTEM

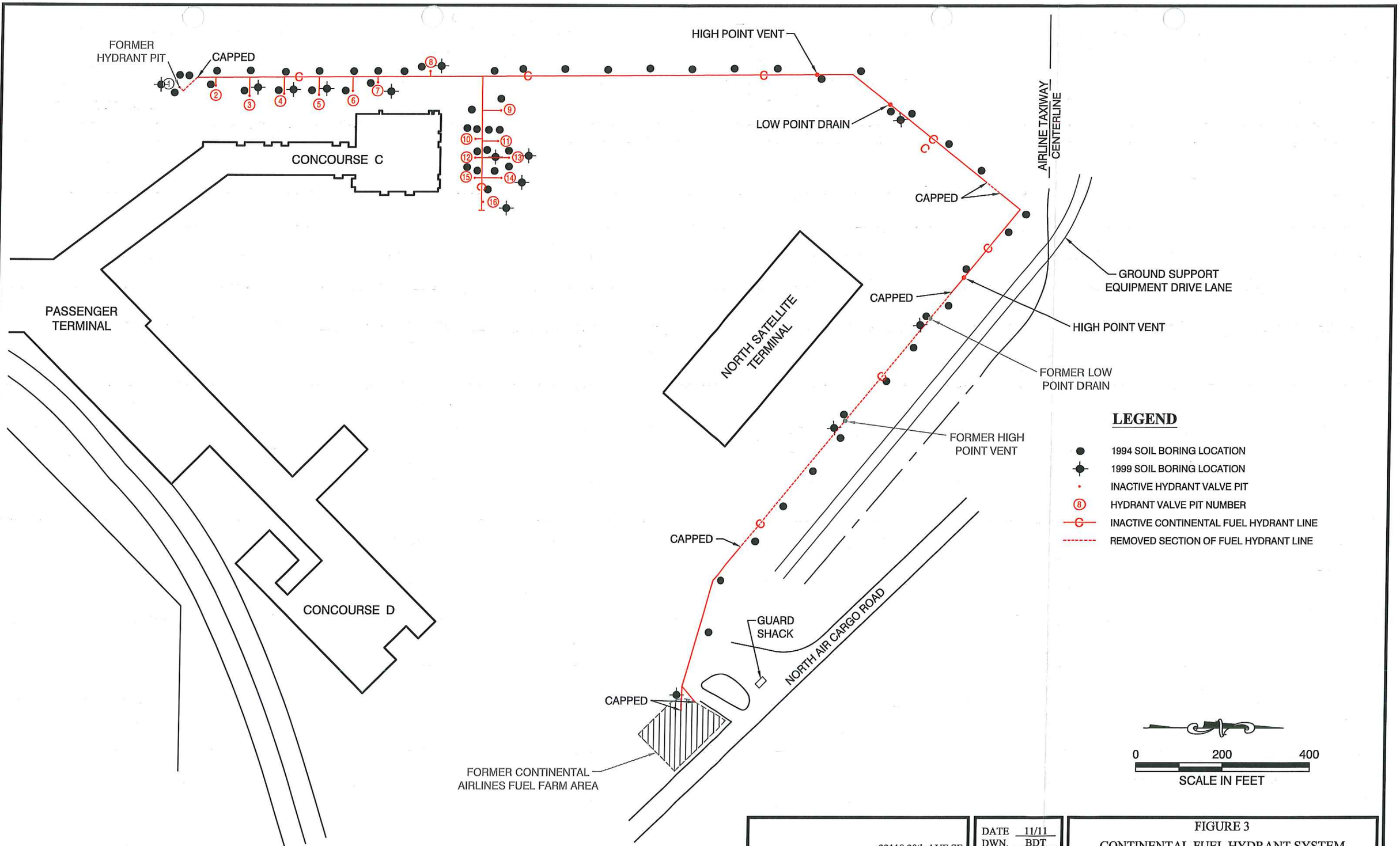

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FIGURE 3

CONTINENTAL FUEL HYDRANT SYSTEM
SEATAC INTERNATIONAL AIRPORT

LOCATIONS OF PREVIOUS SOIL BORINGS

PROJECT PHOTOGRAPHS

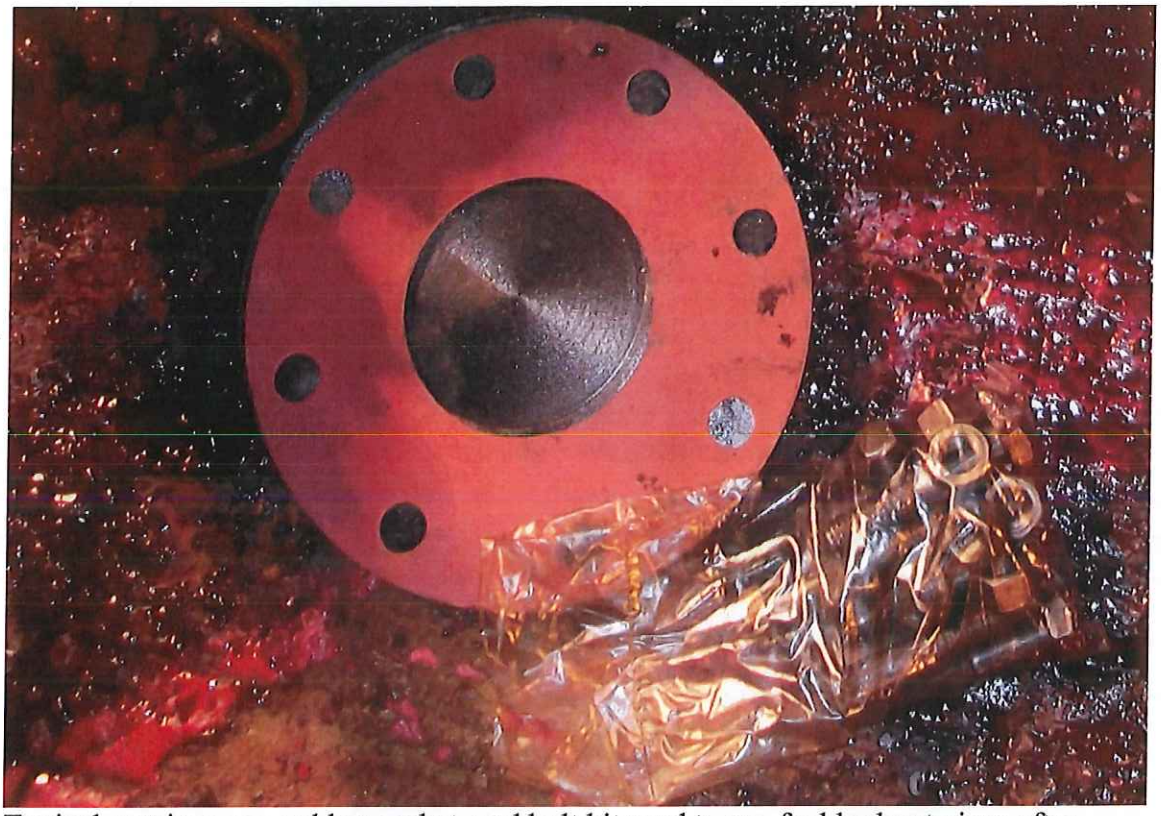
PROJECT PHOTOGRAPHS
Closure of Continental Fuel Hydrant System
SeaTac International Airport

Fuel pit #9 during removal of the hydrant valve.

Hydrant valve removed from fuel pit #5.

PROJECT PHOTOGRAPHS
Closure of Continental Fuel Hydrant System
SeaTac International Airport

Fuel pit #2 after removal of valve and prior to cap installation. The two small compressed air pipes were previously disconnected from the valve and fitted with threaded plugs.



Typical cast iron cap, rubber gasket, and bolt kit used to cap fuel hydrant pipes after removal of the valves.

PROJECT PHOTOGRAPHS
Closure of Continental Fuel Hydrant System
SeaTac International Airport

Fuel pit #14 after installation of cast iron cap.

Filling fuel pit #2 with concrete.

PROJECT PHOTOGRAPHS
Closure of Continental Fuel Hydrant System
SeaTac International Airport

Fuel pit #7 after filling with concrete.


High-point vent after filling with concrete.