APPENDIX J

Impacted and Contaminated Soil and Groundwater Management

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Impacted and Contaminated Soil and Groundwater Management

Liesch Associates Inc.

October 19, 2011

Minneapolis-St. Paul International Airport
2020 Improvements
Environmental Assessment/
Environmental Assessment Worksheet

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Impacted and Contaminated Soil and Groundwater Management

INTRODUCTION

For the management of impacted and contaminated soil and for the management of impacted groundwater during construction dewatering, Liesch has reviewed historical development projects, historical leak sites and spills, and historical uses, all within the Study Area. Additionally, Liesch considered information provided by project personnel for this Environmental Assessment regarding excavation locations and estimations of excavation depths at various projects in assessing the likelihood of encountering impacted soil and groundwater during the course of construction under each alternative.

Section 1 of this technical memorandum discusses methodologies used to characterize soil and groundwater at the Minneapolis-St. Paul International Airport (MSP) and thresholds of significance that define levels of impact to soil and groundwater at MSP.

Section 2 of this technical memorandum discusses Terminal 1-Lindbergh and breaks the areas where excavation will be necessary to complete the work of the Action Alternatives into four areas of current and historical use. Sections 2.1 through 2.4 are discussions of each of those areas of use and include a discussion of the current and historical use, impacts observed at historical development sites, leak sites and spill sites of significance within each area of use.

Section 3 of this technical memorandum discusses Terminal 2-Humphrey and breaks the areas where excavation will be necessary to complete the work of the Action Alternatives into three areas of current and historical use. Sections 3.1 through 3.3 are discussions of each of those areas of use and include a discussion of the current and historical use, impacts observed at historical development sites, leak sites and spill sites of significance within each area of use.

Section 4 of this technical memorandum discusses outlying areas away from the terminals within the Study Area where excavation or investigations will likely be necessary to complete the work of the Action Alternatives. Sections 4.1 through 4.3 discuss the current and historical use, impacts observed at historical development sites, leak sites and spill sites of significance at three separate outlying sites.

1 Methodology and Thresholds

1.1 Soil Characterization Methods

Methods used to determine whether soil is clean, impacted or contaminated are performed in the field and in accordance with the *MSP Soil Management Plan*. The *MSP Soil Management Plan* is approved by the Minnesota Pollution Control Agency (MPCA). The Plan originated in 1999 and was last updated in 2007. Field methods for soil characterization are as follows:

Visual – Observe the soil for petroleum or glycol staining, petroleum or glycol saturation and for debris in the excavated soil.

Olfactory – Observe the soil for petroleum, glycol and/or foreign odors.

Field Screening with a Photoionization Detector (PID) – Screen excavated soil using MPCA field screening procedures as described in MPCA Guidance document 4-04.

Petroleum Sheen Test – If visual, olfactory or field screening with a PID suggest that the soil may be saturated with petroleum, a sheen test will be performed in accordance with the MPCA approved *MSP Soil Management Plan*.

1.2 Soil Characterization Thresholds

Thresholds of significance in determining whether soil is clean, impacted or contaminated are as follows:

Clean Soil – Soil exhibiting no petroleum, glycol, or unidentifiable odors, no visual evidence of impacts or debris, and with field screening PID results within background levels.

Impacted Soil (Uncontrolled Reuse) – Soil exhibiting visual staining, glycol odor, petroleum odor, or field screening PID results less than 20 parts per million (ppm).

Impacted Soil (Controlled Reuse) – Soil exhibiting visual staining, glycol odor, petroleum odor, any unidentified chemical odor or field screening PID results greater than 20 ppm but not saturated by petroleum or glycol.

Contaminated Soil – Petroleum impacted soil exhibiting sheen on the surface of water when performing the petroleum sheen test. Glycol impacted soil exhibiting glycol saturation or near saturation.

Debris Impacted Soil – Soil exhibiting any debris upon excavation are observed for asbestos containing materials, hazardous wastes, construction debris and demolition debris and are managed on a case by case basis.

1.3 Groundwater Characterization Methods

Methods used to determine the condition of groundwater prior to construction dewatering are based on permits currently held by the Metropolitan Airports Commission (MAC) for dewatering at MSP and on project specific permits issued to the MAC for larger dewatering projects previously completed at the MAC.

Visual – Observe the surface of the groundwater for a petroleum sheen or free product.

Laboratory Analysis – Collect groundwater for laboratory analysis to determine if the water is impacted or clean.

Dewatering needs and objective assessment – Determine, through discussions with project personnel, the volume/rate of discharge needed to complete the project and the duration of dewatering needed to complete the project.

Dependent upon analytical results, the volume/rate of discharge and the duration of dewatering, the groundwater may be discharged to the storm sewer, the sanitary sewer or the ground surface under currently held permits or by securing a discharge permit modification for a specific project prior to discharging.

1.4 Groundwater Characterization Thresholds

Thresholds of significance in determining the appropriate discharge location for groundwater dewatering at construction sites are as follows:

Discharge to the Ground Surface – Short term, small quantity groundwater dewatering to the surface within the project site or adjacent grassed areas is permitted as long as the groundwater does not have free product or a petroleum sheen on the surface and the discharge infiltrates back into the ground and does not reach a storm sewer intake.

Discharge to the Storm Sewer System – Discharge of groundwater to the storm sewer system is currently allowed under National Pollutant Discharge Elimination System (NPDES) Permit number MN0065404 with the following limitations:

1) Duration of discharge must be 30 days or less;

2) Analytical results for diesel range organics must not exceed 200 parts per billion (ppb);

3) Analytical results for gasoline range organics must not exceed 200 ppb;

4) The pH of the groundwater must be between 6.0 and 9.0;

5) The discharge flow rate and total gallons discharged must be monitored; and

6) Best Management Practices must be used to control solids in the discharge.

Discharge to the Sanitary Sewer System - Discharge of groundwater to the sanitary sewer system is currently allowed under Metropolitan Council Environmental Services (MCES) Permit number 2255 with the following limitations:

1) The concentration of any one toxic organic parameter (BTEX) must not exceed 3 ppm;
2) The combined total BTEX concentration must not exceed 10 ppm;
3) The total hydrocarbons (DRO and GRO) concentrations must not exceed 100 ppm;
4) Approval of each specific dewatering project must be secured from the MCES prior to discharging;
5) The discharge flow rate and total gallons discharged must be monitored;
6) Groundwater exhibiting a sheen, free product or any of the prohibited waste discharges described in the permit must not be discharged; and
7) Best Management Practices must be used to control solids in the discharge.

1.5 Tanks Removal or Abandonment Methods

Methods used to remove or abandon underground storage tanks (USTs) and aboveground storage tanks (ASTs) and assess the condition of the soil and groundwater at tank sites are from the current MPCA guidance documents. In addition to MPCA guidance that summarizes tank closure procedures, MAC protocol is summarized below:

Removal – The MAC's preference is for unused or unneeded tanks to be removed in accordance with MPCA guidelines.

Abandonment in Place – If it is determined by project engineers that the removal of a UST could jeopardize the integrity of a building or utility, the UST may be abandoned in place in accordance with MPCA guidelines.

Tank Content Characterization and Disposal If the content of a tank is unknown, the contents will be characterized for proper disposal prior to its removal. If the content of a tank is known, proper disposal will be coordinated. In any case, the tank contents will be removed, properly disposed of and the tank will be rendered inert prior to tank removal. The soil will be sampled in accordance with MPCA tanks guidelines at all tank removal and abandonment sites.

2 Terminal 1-Lindbergh Use Area Discussions

The area around Terminal 1-Lindbergh where excavation will be necessary to complete the work of the Action Alternatives is broken down into four areas based on the current and historical use of each area. The use areas are shown on the attached **Figure J.2-1** and **Figure J.2-2** and show the development associated with the Airlines Remain Alternative and the Airlines Relocate Alternative, respectively.

2.1 Roadways / Parking and General Use Area

Historically, this area has been largely utilized for roadways and parking aside from fueling activities for the car rental companies that have been conducted for the last 10-12 years in the northeast corner of the existing blue parking ramp.

Impacts encountered at historical development projects within this area were largely observed in the groundwater with some petroleum impacted bedrock that was in contact with impacted groundwater or where utilities provided a migration corridor through the shallow bedrock.

One leak site in the northeast corner of the blue ramp and associated with the car rental fueling activities exists within this area.

2.2 Aircraft Fueling and Deicing Area

Historically, this area has been utilized as gates for the G concourse where aircraft fueling and deicing have been conducted.

Impacts encountered at historical development projects within this area include petroleum and glycol impacted soil and groundwater.

Two historical leak sites exist within this area: one at gate G1 reported in 1989 and one reported in 1971 from the fuel delivery system at an unknown location.

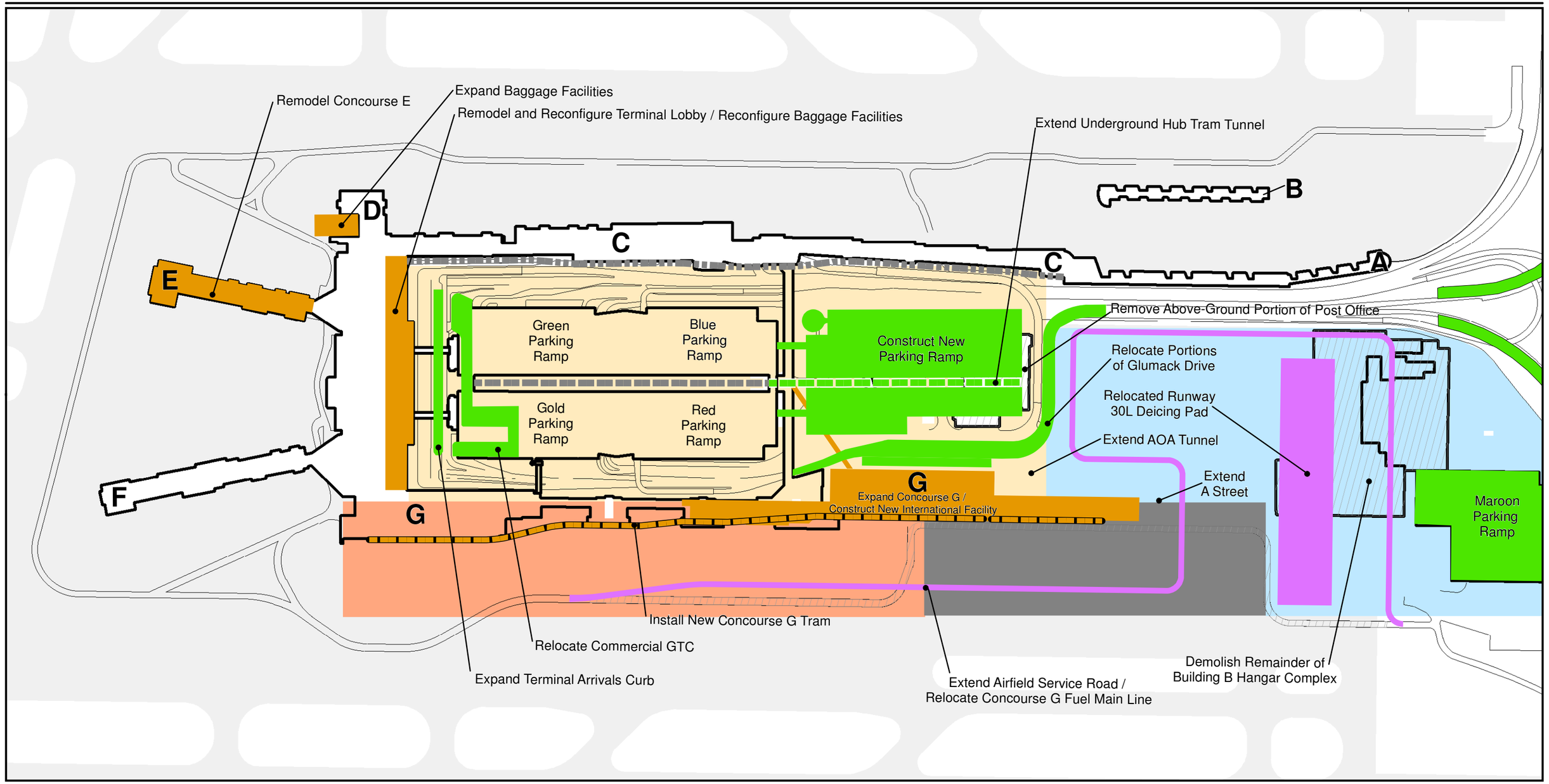
2.3 Aircraft Deicing Area

Historically, this area has been utilized for deicing. Liesch has no record of historical development sites, leak sites or spill sites of significance within this area.

2.4 Aircraft Maintenance and Industrial Use Area

Historically, this area has been utilized for aircraft maintenance and repair. The area currently includes Delta Airlines Building B where aircraft maintenance and repair continues.

The demolished portion of Building B was located in the currently open space west of the remaining Building B. Impacts of petroleum, solvents, and elemental mercury were encountered during demolition and during subsurface investigations at the former Building B site.



LEGEND

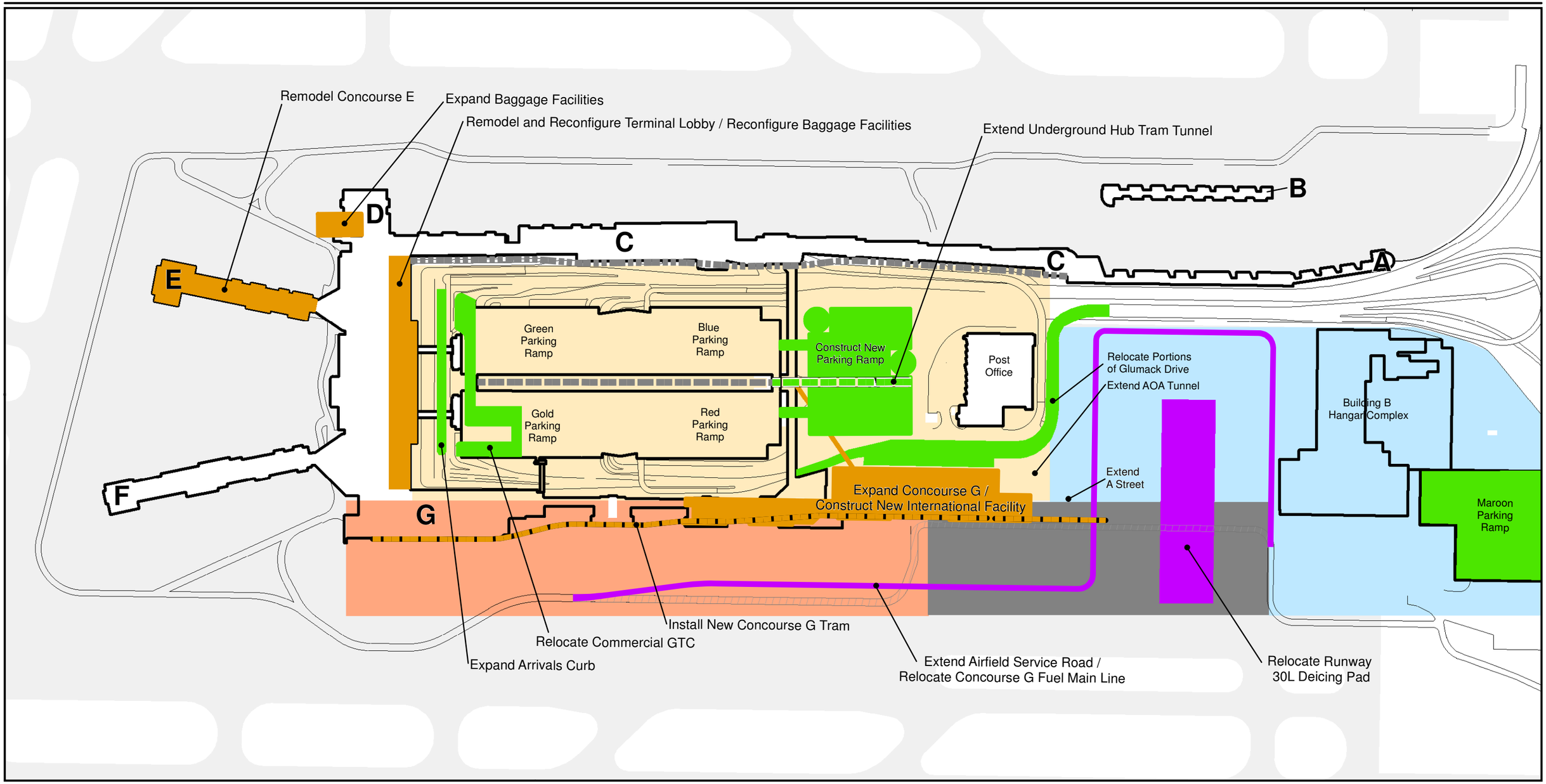
- Existing Building
- Existing Airfield Pavement
- Proposed Terminal Projects
- Proposed Landside/Roadway Projects
- Proposed Airside Projects
- Remove and/or Relocate
- MAC Property
- Underground Hub Tram
- Concourse C Tram
- Proposed Tram
- Aircraft Maintenance and Industrial Use
- Aircraft Deicing
- Aircraft Fueling and Deicing
- Roadways/parking General Use

Alternative 1 - Airlines Remain - Terminal 1-Lindbergh - Current and Historical Use Area

0 200 400 800 Feet

Source: Minneaoplis-St. Paul International Airport

Disclaimer: This map was generated by Liesch Associates, Inc. using GIS (Geographic Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitablity for a particular use. The scale and location of all mapped data are approximate.



LEGEND

- Existing Building
- Existing Airfield Pavement
- Proposed Terminal Projects
- Proposed Landside/Roadway Projects
- Proposed Airside Projects
- Remove and/or Relocate
- MAC Property
- Underground Hub Tram
- Concourse C Tram
- Proposed Tram
- Aircraft Maintenance and Industrial Use
- Aircraft Deicing
- Aircraft Fueling and Deicing
- Roadways/parking General Use

Alternative 2 - Airlines Relocate - Terminal 1-Lindbergh - Current and Historical Use Areas

0 200 400 800 Feet

Source: Minneaoplis-St. Paul International Airport

Five historical leak sites exist within this area. All the leak sites are associated with USTs at the western edge of the Study Area or immediately west of the Study Area. Some USTs have been removed or abandoned in place while others are still in use at the site.

3 Terminal 2-Humphrey Use Area Discussions

The area around Terminal 2-Humphrey where excavation will be necessary to complete the work of the action alternatives are broken down into three areas based on the current and historical use of each area. The use areas are shown on the attached **Figure J.3-1** and **Figure J.3-2** and show the development associated with the Airlines Remain Alternative and the Airlines Relocate Alternative, respectively.

3.1 Aircraft Fueling and Historical Deicing Area

Historically, this area has been utilized as a remote apron where aircraft were parked and deiced. Currently the area is used as Terminal 2–Humphrey gates where aircraft fueling and deicing are conducted.

Impacts encountered at historical development projects within this area include petroleum and glycol impacted soil. Groundwater immediately north of this area was found to be clean during dewatering for the Taxiway C Expansion project conducted in 2011, while groundwater immediately south of this area was found to be impacted during dewatering for the LRT South Portal Boat Section construction in 2001 as indicated in Figure 4 of the *2010 Annual Soil Management Report*.

One historical leak site from 2009 and one spill site from 2006 exist within this area. Both are at or near the fuel facility southwest of Terminal 2-Humphrey. Note that none of these spills were associated with MAC activity.

3.2 Aircraft Maintenance and Industrial Use Area

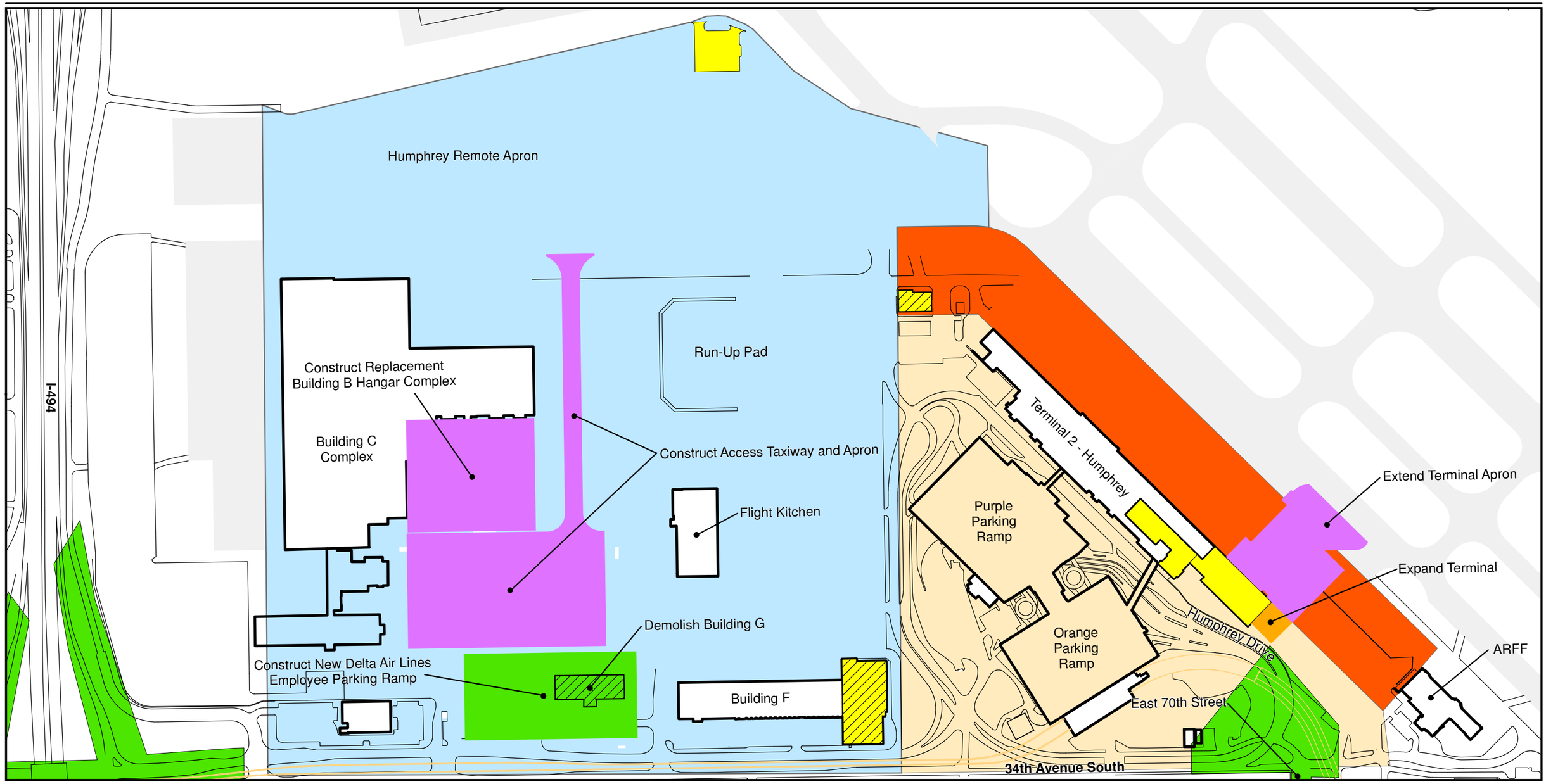
Currently, this area is utilized for aircraft maintenance and repair as well as aviation support vehicles and equipment maintenance, a flight kitchen for aviation food services and offices and parking. The area was largely undeveloped prior to its current use.

Although there has been minimal redevelopment work completed within this area, some petroleum impacts were encountered during demolition of the former Sun Country hangar in the southwest corner of this area.

Three historical leak sites exist within this area.

3.3 Former HHH Terminal and Industrial Use Area

Historically, this area has been utilized as gates for the former HHH Terminal where aircraft fueling and deicing have been conducted. Additionally, the western portion of this area had historically been utilized for aircraft and aviation support vehicle and equipment maintenance and repair.



LEGEND

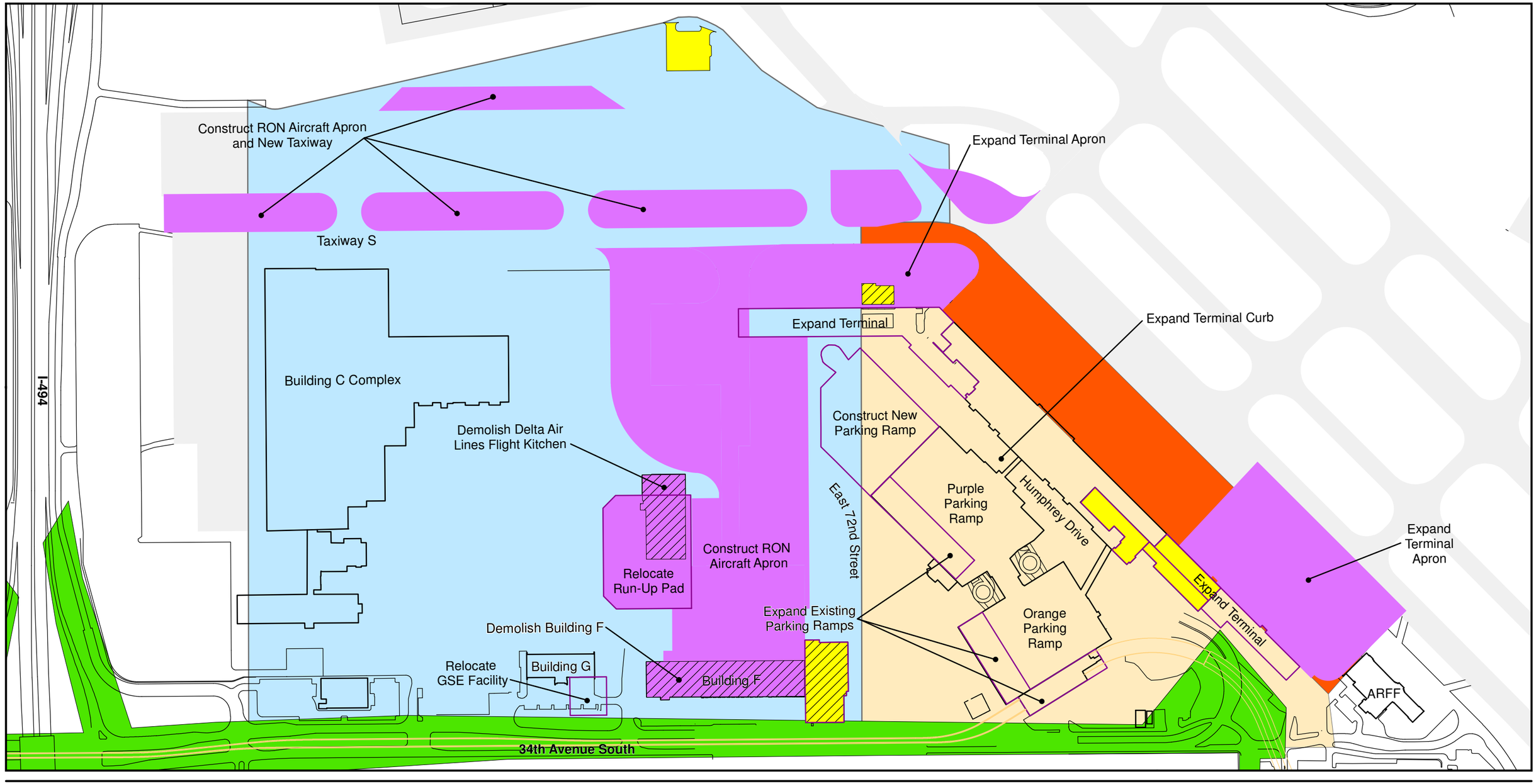
- Existing Building
- Existing Airfield Pavement
- Proposed Terminal Projects
- Proposed Airside Projects
- Proposed Landside/Roadway Projects
- Projects that are Underway
- LRT Tracks
- MAC Property
- Remove and or Relocate
- Aircraft Maintenance and Industrial Use
- Aircraft Fueling and Historical Deicing
- Former HHH Terminal and Industrial Use

Alternative 1 - Airlines Remain - Terminal 2-Humphrey - Current And Historical Use Areas

N

0 200 400 800 Feet

Source: Minneaoplis-St. Paul International Airport



LEGEND

- Existing Building
- Existing Airfield Pavement
- Proposed Terminal Projects
- Proposed Airside Projects
- Proposed Landside/Roadway Projects
- Projects that are Underway
- LRT Tracks
- MAC Property
- Demolish and/or Relocate
- Aircraft Maintenance and Industrial Use
- Aircraft Fueling and Historical Deicing
- Former HHH Terminal and Industrial Use

Alternative 2 - Airlines Relocate - Terminal 2-Humphrey - Current And Historical Use Areas

Source: Minneaoplis-St. Paul International Airport

0 205 410 820 Feet

Impacts encountered at historical development projects within this area include petroleum and glycol impacted soil and groundwater.

One historical leak site from 1988 at a former fuel facility exists within this area.

4 Outlying Areas

There are three areas within the Study Area away from Terminal 1-Lindbergh and Terminal 2-Humphrey worth note. See **Figure J.4-1** for the location of each.

4.1 Proposed New Flight Kitchen

The Federal Express building is immediately south of the proposed site for the new flight kitchen. During construction of the Federal Express building, petroleum impacted soil was encountered and managed on site below the Federal Express parking lot. Additionally, the MAC Fire department previously conducted training exercises in the area of the proposed construction site.

4.2 Super America Gas Station

A leak was reported at the Super America station in 2001. It is likely that petroleum impacted soil remains at this site.

4.3 34th Avenue Fueling Facility

Petroleum impacted soil was managed during a facility modification and improvement project conducted in 2005. Impacted soils remain at the site. There are four reported spills of significance reported at this site and one closed leak site.

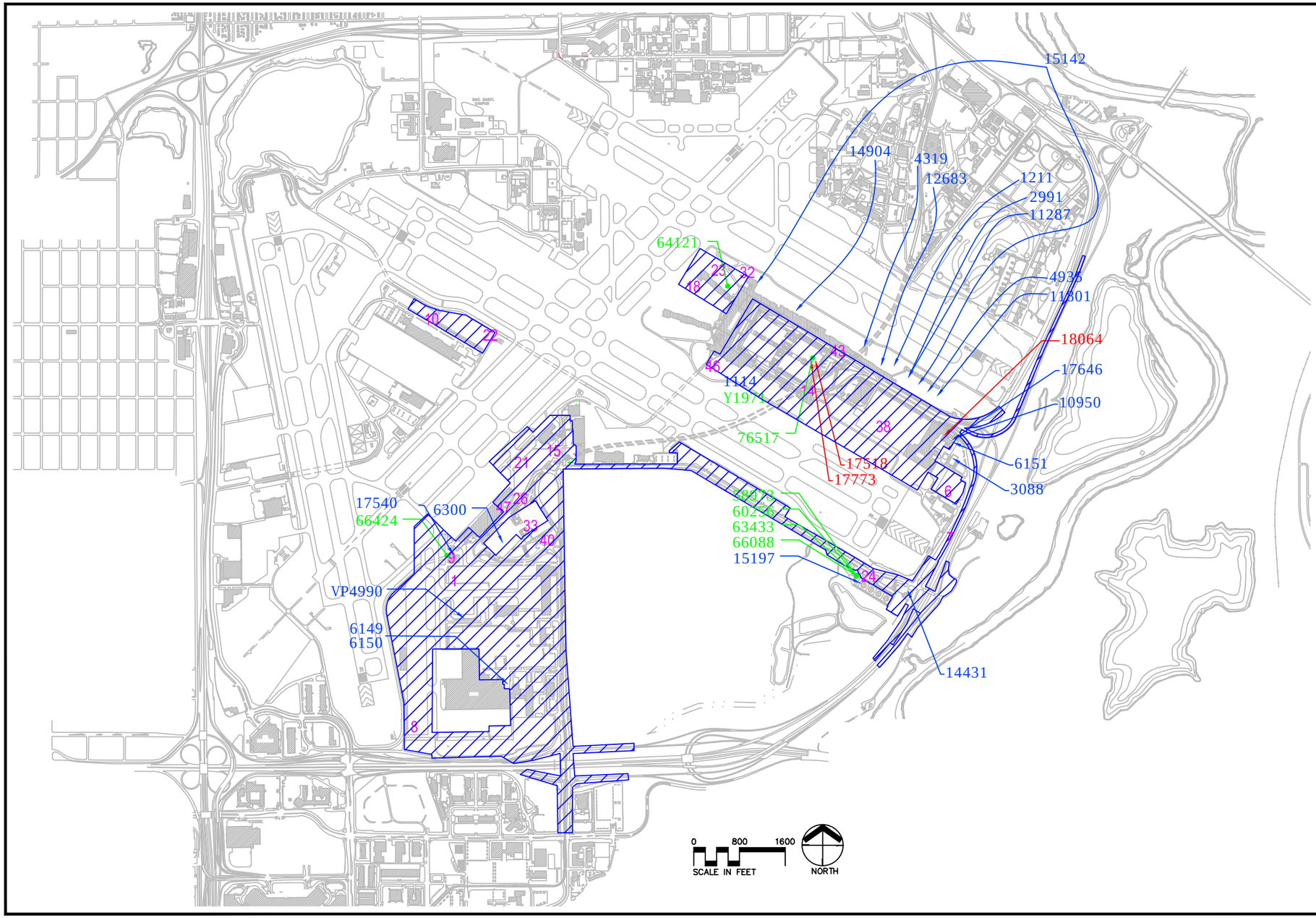
5 Alternatives Analysis

5.1 Conclusion

Without detailed plan sheets and specifications and a thorough environmental and geotechnical investigation of every excavation site, there is no way to determine the extent of impacted or contaminated soil, bedrock or groundwater or the extent to which the excavated soil might be reused on site.

In general, Terminal 1-Lindbergh soils are relatively shallow over the Platteville Limestone bedrock. The Platteville formation is water bearing and relatively shallow. Impacted groundwater has been encountered at historical development sites in the areas around Terminal 1-Lindbergh that are proposed for development under both Action Alternatives.

In general, Terminal 2-Humphrey soils are relatively deep over the Prairie Du Chien bedrock. The soil over the Prairie Du Chien is sandy, potentially providing more opportunity for on-site reuse than soils excavated from Terminal 1-Lindbergh areas. Groundwater in the area of



LEAK SITES
1114 MAC GATE 1 (1989)
1211 NATIONAL CAR RENTAL (1989))
2991 HERTZ RENT A CAR (1990)
3088 NWA BUILDING B MAINTENANCE FACILITY (1990)
4319 USPS AIRMAIL FACILITY (1991)
4935 AVIS RENT A CAR (1991)
6149 (NWA BUILDING C - MINERAL SPIRIT) (1993)
6150 (NWA) (1993)
6151 NWA BUILDING B (1993)
6300 SIGNATURE FLIGHT SUPPORT (1988)
10950 BUILDING B TEST CELL AREA MSP (1997)
11287 HERTZ RENT A CAR (1998)
11801 ALAMO CAR RENTAL (1998)
12683 BUDGET RENT A CAR (1999)
14431 SUPERAMERICA NO. 4369 (2001)
14904 ENERGY MANAGEMENT CENTER (2002)
15142 MSP AIRPORT - LINDBERGH TERMINAL (2003)
15197 MSP AIRPORT POST ROAD TANK FARM (2003)
17518 MPLS/ST. PAUL CAR RENTAL QTA (2009)
17540 HHH BULK FACILITY RELEASE (2009)
17646 NWA AIRLINES BUILDING B (2009)
17773 MSP AIRPORT HERTZ RENTAL CAR SERVICE (2009)
18064 DELTA AIRLINES BUILDING B (2010)

VIC PROGRAM SITES
VP - 4990 NWA (1994)

SELECTED SPILL SITES (Spill ID#)
58973 MFC VESSEL #6 POST ROAD FUEL FARM (2003)
60256 MFC POST ROAD FUEL FARM (2003)
63433 MFC RECLAIM TANK (2005)
64121 GATE E-4 CONSTRUCTION (2005)
66424 ASIG FUEL TRUCK AT HHH FUEL FARM (2006)
66088 MAGELLAN PIPELINE - MSP STATION (2006)
76517 HERTZ RENTAL CAR (2009)

Y1971 - 1971 HYDRANT RELEASE* (1971)

SITES WHERE SOIL MANAGEMENT WAS REQUIRED
1. SIGNATURE GROUND SERVICES BUILDING (2000)
6. MAC PARKING REPLACEMENT PROJECT (2000)
7. NORTHWEST DRIVE AND POST ROAD PROJECT (2000)
8. SUN COUNTRY APRON EXPANSION (2000)
9. HUBERT H. HUMPHREY TERMINAL FUELING PROJECT (2000)
10. MAC FEDERAL EXPRESS CARGO BUILDING (2001)
14. LRT SOUTH SHAFT (2001)
15. MAC LRT SOUTH PORTAL (2001)
18. 2004 PAVEMENT REHABILITATION (2004)
21. 2005 HUMPHREY FUEL LINE INSTALLATION (2005)
22. RWY 4-22 TUNNEL (PHASE 2) (2005)
23. 2005 PAVEMENT REHABILITATION (2005)
24. MSP FUEL CONSORTIUM MODIFICATIONS/IMPROVEMENTS (2005)
26. HUMPHREY PARKING ENTRANCE P.O. (2005)
32. 2006 PAVEMENT REHABILITATION (2006)
33. HUMPHREY ORANGE RAMP (2006-08)
38. CONCOURSE G EXPANSION SITE PREPARATION - BID PACKAGE #2 (2008)
40. HUMPHREY TERMINAL EXPANSION B.P.R.4 - EXIT ROADWAYS (2009)
43. TRANSIT CENTER VALVE VAULT (2009)
46. LINDBERGH TERMINAL SOUTH BAGGAGE SCREENING (2010)
47. HUMPHREY TERMINAL SKYWAY EXPANSION (2010)

(XXXX) - YEAR IN WHICH THE PROJECT WAS INCLUDED IN THE ANNUAL SOIL MANAGEMENT REPORT

LEGEND

XXXX - Spill Site (Closed)
XXXX - Active Site (Open)
XXXX - Closed Site
XX - Site Where Soil Management Was Conducted

Study Area

* Y1971 is a reference to a hydrant fuel release that occurred in 1971. The release occurred at the G Concourse, no specific location provided.

Soil Management and Release Sites

Source: Data compiled and maintained Liesch Associates, Inc. Base Map provided by TKDA.

Terminal 2-Humphrey is relatively deep and dewatering of groundwater to accommodate construction is less likely to be necessary in the Terminal 2-Humphrey area. There will be no discernible difference between the action alternatives as the MAC will manage excavated materials at development projects in accordance with the Soil Management Plan and construction dewatering will be done in accordance with appropriate NPDES and MCES permits.

The result is that excavated soil with impacts and contamination are either hauled off site for proper disposal or managed in a manner that protects human health and the environment and groundwater dewatered to accommodate construction, if impacted, is treated. Therefore, regardless of the chosen alternative or of the amount of impacted and contaminated material encountered during the development of any alternative, development at MSP property has a remedial effect.