

**FORMER HILLCREST GOLF COURSE
ENVIRONMENTAL CONTAMINATION & REMEDIATION CONSIDERATIONS
SAINT PAUL PORT AUTHORITY
APRIL 10, 2020**

Site History

- The Hillcrest Site was first developed in the 1920's as a golf course that became a private golf club that included a clubhouse, related amenities and maintenance facilities. The golf course ceased operations in 2017, and the Site was acquired by the Saint Paul Port Authority in 2019.

Contamination Sources and Locations

- Contamination Caused by Golf Course Operations: Golf course operations resulted in soil contamination caused by the storage and use of petroleum products, other hazardous substances related to golf course management, and agricultural fertilizers and fungicides for turf management.
- Mercury is Biggest Contamination Issue: The biggest contamination issue at the Site is mercury in soil from the historic application of specialty fungicides which are estimated to have started in 1950's and continued until 1997 when the fungicides with mercury were banned.
- Widespread Contamination: The mercury contamination at the Site is widespread, with mercury concentrations exceeding applicable regulatory standards in all soil samples collected to date from former tee boxes, fairways, and greens across much of the Site. An estimated **40%-50%** of the former golf course areas of the Site (excluding clubhouse, parking lots and ponds) are affected by mercury-impacted soil that will require excavation and cleanup for redevelopment (see attached map).
- Contamination is Mostly Shallow: Mercury contamination has also been detected in soil samples collected near former agricultural chemical storage and equipment maintenance areas. The mercury contaminated soil extends in depth to approximately 1-foot in former fairways, up to 1.5 feet in former tees boxes, and up to 2.5 feet in former green/fringe areas.

Contamination Levels, Cleanup Standards and Regulatory Oversight

- Mercury Concentrations: Mercury has been detected in soil samples collected from areas near the former golf course greens/fringes at concentrations up to **144 milligrams per kilogram (mg/kg)**, in former tee boxes at concentrations up to **7.0 mg/kg**, and in former fairways at concentrations **5.1 mg/kg**.
- Future Soil Cleanup Standards: The current residential and industrial regulatory comparison criteria for mercury in soil are **0.5 mg/kg** and **1.5 mg/kg**, respectively. These comparison criteria are commonly used as cleanup standards for redevelopment projects.
- Regulatory Agency Involvement: The Hillcrest Site is enrolled in voluntary investigation and cleanup programs through both the Minnesota Department of Agriculture (MDA) and Minnesota Pollution Control Agency (MPCA) to obtain required regulatory agency approvals and receive liability assurance letters needed to support redevelopment. MDA involvement on this project is triggered by the historic use of agricultural fertilizers and fungicides at the Site. MPCA involvement will address other non-agricultural contaminants at the Site including petroleum.

Site Cleanup Approach

- Regulatory Agency Must Approve Cleanup Plan: The site cleanup approach will be outlined in a cleanup plan that will be submitted to the respective MDA and MPCA for review and approval. The requirements of the cleanup plan must be tailored to the site development plan and future uses.
- Future Soil Cleanup Standards: Mercury-contaminated soil above the residential SRV of **0.5 mg/kg** (future residential or recreational use areas) and industrial SRV of **1.5 mg/kg** (future commercial or industrial use areas) will need to be excavated and managed in accordance with the agency-approved cleanup plan.
- On-Site and Off-Site Soil Management: Site soils with the highest levels of mercury contamination (i.e., former greens/fringes) will likely require off-site disposal at a permitted landfill, and soils with lower levels of mercury contamination will likely be suitable for placement at pre-approved locations.

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- Cover Considerations for Placed Contaminated Soil: Soils placed on-site will be subject to other requirements such as installation of a 4-foot thick clean fill cap on top of the placed soil (in green space areas) or installation of a clean 2-foot cover (in future asphalt paved roadway areas).
- Future Restrictions: The MDA will require that the location of the mercury-impacted soil placed on-site be documented in a Restrictive Covenant filed with the deed for the property.

Site Cleanup Considerations

- Important to Coordinate Site Cleanup with Development Plan: Site cleanup will need to be coordinated with the mass grading for Site development for efficiency, cost effectiveness technical reasons. Thus, the cleanup plan will need to consider future grades, cut and fill areas, future parcel boundaries for future developments, future property uses by development area, and site geotechnical requirements.
- Big Cost Implications if Site Cleanup is Planned Separately: If site cleanup is planned and implemented independent of the mass grading for site development, the site cleanup costs will increase substantially since on-site consolidation will likely become impractical.
- Final Excavation Extent Determined During Site Cleanup: Site cleanup will be documented through post excavation sampling and testing program to demonstrate that the mercury concentrations in the remaining soil meet the relevant SRVs for future use. In our experience, it is likely that the final excavation extent for site cleanup will be substantially greater in some locations compared to the planned excavation limits estimated through the site investigation process.
- Saving Large Areas of Trees May Not Practical: Because the excavation extent will be determined during site cleanup, it may not be practical to ensure specific trees or areas of trees can be saved.
- On-Site Soil Placement Considerations: Specific placement locations **must be** identified in approved cleanup plan and will be subject to clean fill separation distances specified in the plan, **must be** structurally suitable for intended use, **must not be** placed within future development parcels for liability reasons, **must not be** placed beneath areas targeted for storm water infiltration, **must not be** placed at locations or depths close to natural groundwater, **must be** placed below depth of future utilities if placed within future roadway right of way property.

