

**OFFICE OF THE NEVADA ENVIRONMENTAL RESPONSE TRUST
TRUSTEE**

**Le Petomane XXVII, Inc., Not Individually, But Solely as the Nevada Environmental Response Trust Trustee
35 East Wacker Drive - Suite 690
Chicago, Illinois 60601
Tel: (702) 357-8149, x104**

September 13, 2018

Dr. Weiquan Dong, Ph.D.
Bureau of Industrial Site Cleanup
Nevada Division of Environmental Protection
2030 E. Flamingo Rd, Suite 230
Las Vegas NV 89119

RE: Compilation of Select Health Risk Assessment Documents for Parcels C and D: 2007 to 2018,
and Request for a No Further Action Determination
NDEP Facility ID # H-000539
Nevada Environmental Response Trust Site
Henderson, Nevada

Dear Dr. Dong:

On behalf of the Nevada Environmental Response Trust (NERT or the Trust), this letter requests issuance of a No Further Action (NFA) determination for Parcels C and D. NERT has completed an investigation of these parcels and submitted several reports documenting the conditions at the property. Attached to this letter is the *Compilation of Select Health Risk Assessment Documents for Parcels C and D: 2007 to 2018*, dated August 20, 2018. This Compilation was prepared with the objective of assembling into one “binder” the key health risk assessment (HRA) documents that have been completed for soil, soil gas, and groundwater at Parcels C and D. In this letter, the Trust is requesting a NFA determination for Parcels C and D to address the soil direct contact pathway as well as the vapor intrusion pathway from soil gas and groundwater. In support of this request, the risk estimates for Parcels C and D from the final HRA report (*Health Risk Assessment for Parcels C, D, and G, Revision 1*, dated November 3, 2017 and approved by the Nevada Division of Environmental Protection [NDEP] on January 19, 2018) are summarized and presented below.

Summary of the HRA

Based on the conceptual site model (CSM) for Parcels C and D, the post-remediation HRA was conducted to evaluate potential risks to future onsite workers from exposures to residual levels of chemicals, radionuclides, and asbestos in soils and volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) released from soil gas and groundwater to indoor, outdoor, and trench air.

- Soil: Potential exposure to soil was evaluated for future onsite indoor and outdoor commercial/industrial workers and construction workers via direct contact with soil (i.e., incidental ingestion and dermal contact) and inhalation of airborne particulates, based on the post-remediation soil data collected at 0-10 feet below ground surface (bgs) in Parcels C and D in 2007-2016. Through a multi-step process consisting of a concentration/toxicity screen, background evaluation for metals and radionuclides, and chemical-specific considerations, seven chemicals were identified as chemicals of potential concern (COPCs) in soil for Parcel C,

including dioxin toxicity equivalent (TEQ), hexachlorobenzene, octachlorostyrene, metals (palladium and zirconium), and asbestos (long amphibole fibers and long chrysotile fibers), and four chemicals were identified as COPCs in soil for Parcel D, including metals (palladium and zirconium) and asbestos (long amphibole fibers and long chrysotile fibers).

Non-cancer hazard indices (HIs) and excess lifetime cancer risks associated with direct contact with soil and inhalation of airborne particulates were estimated for all the soil COPCs (except asbestos, see below) based on the 95% upper confidence limit (UCL) on the mean soil concentration at the 0-2 feet depth interval and at the 0-10 feet depth interval within each parcel. For future onsite indoor and outdoor commercial/industrial workers and construction workers in Parcels C and D, the estimated HIs were below the NDEP target HI of less than or equal to one for non-cancer effects (the maximum HI was 0.9), and the estimated excess lifetime cancer risks were below or within the NDEP target cancer risk range of 10^{-6} to 10^{-4} (the maximum estimated excess lifetime cancer risk was 1×10^{-5}). Dioxin TEQ is the primary contributor in soil to the total estimated cancer risk.

With regard to asbestos (long amphibole and long chrysotile fibers), a best estimate and an upper-bound estimate of potential cancer risk via inhalation of airborne particulates for indoor commercial/industrial workers, outdoor commercial/industrial workers, and construction workers were calculated for each parcel. The estimated combined risks for death from lung cancer and mesothelioma associated with asbestos exposures were below or within the NDEP acceptable cancer risk range of 10^{-6} to 10^{-4} (the maximum estimated excess lifetime cancer risk was 4×10^{-6}).

- **Soil Gas:** Potential exposure to soil gas was evaluated for future onsite indoor and outdoor commercial/industrial workers and construction workers via inhalation of vapors migrating from soil gas to indoor air, outdoor air, and trench air respectively, based on the soil gas data collected within or near Parcels C and D at five feet bgs in 2008 and 2013 and at 10 feet bgs in 2007. All volatile chemicals detected in at least one soil gas sample were selected as soil gas COPCs. A total of 59 volatile chemicals were identified as soil gas COPCs for Parcel C, and a total of 57 volatile chemicals were identified as soil gas COPCs for Parcel D.

Non-cancer HIs and excess lifetime cancer risks associated with inhalation of vapors migrating from soil gas to indoor air, outdoor air, and trench air were estimated for all identified soil gas COPCs based on the maximum detected soil gas concentrations within each parcel. For future onsite indoor and outdoor commercial/industrial workers and construction workers in Parcels C and D, the estimated HIs were below the NDEP target HI of less than or equal to one for non-cancer effects (the maximum HI was 0.1). The estimated excess lifetime cancer risks were below or within the NDEP target cancer risk range of 10^{-6} to 10^{-4} . For the 5 foot soil gas samples, the maximum estimated excess lifetime cancer risk was 2×10^{-6} for Parcel C and 1×10^{-6} for Parcel D. For the 10 foot soil gas samples, the maximum estimated excess lifetime cancer risk was 4×10^{-5} in Parcel C and 1×10^{-6} for Parcel D. Chloroform, from a trespassing groundwater plume, was the only chemical risk contributor with an excess lifetime cancer risk greater than 1×10^{-6} .

- **Groundwater:** Potential exposure to shallow groundwater (approximately 25-30 feet bgs) was evaluated as an additional line of evidence for the vapor intrusion pathway for future onsite indoor and outdoor commercial/industrial workers and construction workers via inhalation of vapors migrating from groundwater to indoor air, outdoor air, and trench air respectively, based on the shallow groundwater data collected within or near Parcels C and D within the most recent two years. All volatile chemicals detected in at least one shallow groundwater sample were

selected as groundwater COPCs. A total of 76 volatile chemicals were identified as groundwater COPCs for Parcel C, and a total of 25 volatile chemicals were identified as groundwater COPCs for Parcel D.

Non-cancer HIs and excess lifetime cancer risks associated with inhalation of vapors migrating from groundwater to indoor air, outdoor air, and trench air were estimated for all identified groundwater COPCs based on the maximum detected groundwater concentrations within each parcel. For future onsite indoor and outdoor commercial/industrial workers and construction workers in Parcels C and D, the estimated HIs were below the NDEP target HI of less than or equal to one for non-cancer effects, except that the estimated HI for indoor commercial/industrial workers in Parcel C was slightly over the NDEP target HI (the HI was 2 based on the maximum detected concentrations within Parcel C but 1 based on the maximum detected concentrations in individual wells). The estimated excess lifetime cancer risks were below or within the NDEP target cancer risk range of 10^{-6} to 10^{-4} . The maximum estimated excess lifetime cancer risk was 1×10^{-5} in Parcel C and 3×10^{-6} in Parcel D. In both parcels, chloroform is the primary contributor in groundwater to the total estimated cancer risk.

The cumulative cancer risk and non-cancer HI for each receptor population were estimated by summing the results from direct contact with soil and the results from inhalation of soil gas migrating to air. For future onsite indoor and outdoor commercial/industrial workers and construction workers in Parcels C and D, the estimated cumulative HIs were below the NDEP target HI of less than or equal to one for non-cancer effects (the maximum cumulative HI was 0.9), and the estimated cumulative cancer risks were below or within the NDEP target cancer risk range of 10^{-6} to 10^{-4} . Only the cumulative cancer risks in Parcel C exceeded 1×10^{-6} , with a maximum cumulative cancer risk of 4×10^{-5} for future indoor commercial/industrial workers. The main chemical contributors to the cumulative risk were dioxin TEQ in soil and chloroform in soil gas/groundwater.

It should be noted that the site-specific action level for dioxin TEQ (0.0027 milligram per kilogram [mg/kg]) would correspond to a cancer risk of 6×10^{-5} for an outdoor commercial/industrial worker (Northgate Environmental Management, Inc. [Northgate] 2010¹), which is higher than the maximum estimated excess lifetime cancer risk for Parcel C based on dioxin TEQ in soil which is 1×10^{-5} . Locations where the estimated excess lifetime cancer risk for vapor intrusion is greater than 1×10^{-6} for future indoor commercial/industrial workers in Parcel C include at the southern boundary near the Operations Area and on the west side of Parcel C, downgradient of Parcel E, which contains the Olin Chlor Alkali/Stauffer/Syngenta/ Montrose (OSSM) groundwater treatment system.

No Further Action Determination

Acknowledging NDEP's prior approval of the HRA, the environmental investigations and HRA tasks for Parcels C and D have been deemed complete by NERT. Accordingly, the Trust concludes that a NFA determination for Parcels C and D is warranted and requests that NDEP issue the NFA determination for soil less than 10 feet bgs (direct contact pathways) as well as soil gas and shallow groundwater (vapor intrusion pathways). Enclosed with this letter is the approved Environmental Covenant, signed by NERT and once signed by NDEP, will be recorded.

¹ Northgate. 2010. Results of Bioaccessibility Study for Dioxin/Furans in Soil, Tronox LLC, Henderson, Nevada. May 24. NDEP approved May 25, 2010.

Office of the Nevada Environmental Response Trust Trustee
September 13, 2018

If you have any questions or concerns regarding this matter, feel to contact me at (702) 960-4309 or at steve.clough@nert-trust.com.

Office of the Nevada Environmental Response Trust



Stephen R. Clough, P.G., CEM
Remediation Director
CEM Certification Number: 2399, exp. 3/24/19

Cc (via NERT Sharefile Distribution):

Jeff Kinder, NDEP, Deputy Administrator
James Dotchin, NDEP, Chief, Bureau of Industrial Site Cleanup
Carlton Parker, NDEP, Bureau of Industrial Site Cleanup
Weiuan Dong, NDEP, Bureau of Industrial Site Cleanup
Alan Pineda, NDEP, Bureau of Industrial Site Cleanup
Christa Smaling, NDEP, Bureau of Industrial Site Cleanup
Frederick Perdomo, Nevada Attorney General's Office
Alison Fong, U.S. Environmental Protection Agency, Region 9
Mark Duffy, U.S. Environmental Protection Agency, Region 9
Jay Steinberg, as President of the Nevada Environmental Response Trust Trustee and not individually
Andrew Steinberg, as Vice President of the Nevada Environmental Response Trust Trustee and not individually
Brian Loffman, Le Petomane, Inc.
Tanya C. O'Neill, Foley and Lardner, LLP
Allan DeLorme, Ramboll
John Pekala, Ramboll
Kim Kuwabara, Ramboll
Dan Pastor, Tetra Tech
David Bohmann, Tetra Tech

Cc (via NERT Stakeholder Sharefile Distribution):

Betty Kuo, Metropolitan Water District of Southern California
Brenda Pohlmann, City of Henderson
Carol Nagai, Metropolitan Water District of Southern California
Dave Johnson, LV Valley Water District
David Parker, Central Arizona Project
Eric Fordham, Geopentech
Jill Teraoka, Metropolitan Water District of Southern California
Kevin Fisher, LV Valley Water District
Marcia Scully, Metropolitan Water District of Southern California
Maria Lopez, Metropolitan Water District of Southern California
Mickey Chaudhuri, Metropolitan Water District of Southern California
Orestes Morfin, Central Arizona Project
Peggy Roefer, Colorado River Commission
Steven Anderson, LV Valley Water District
Todd Tietjen, Southern Nevada Water Authority

Cc (via NERT BMI Companies Sharefile Distribution):

Office of the Nevada Environmental Response Trust Trustee
September 13, 2018

Anna Springsteen, Neptune Inc.
Kirk Stowers, Broadbent Inc.
Kristen Lockhart, Neptune Inc.
Kurt Fehling, The Fehling Group
Patti Meeks, Neptune Inc.
Paul Black, Neptune Inc.
Paul S. Hackenberry, Hackenberry Associates
John Edgcomb, Edgcomb Law Group
Andrew Barnes, Geosyntec
Brian Waggle, Hargis + Associates
Chinny Esakkiperumal, Olin Corporation
Chuck Elmendorf, Stauffer
Curt Richards, Olin Corporation
Dave Share, Olin Corporation
Ebrahim Juma, Clean Water Team
Ed Modiano, de maximus
Gary Carter, Endeavour LLC
George Crouse, Syngenta
Harry Van Den Berg, AECOM
Jeff Gibson, Endeavour LLC
Joanne Otani, Joanne M. Otani LLC
Joe Kelly, Montrose Chemical
Joe Leedy, Clean Water Team
Kelly McIntosh, GEI Consultants
Kevin Lombardozzi, Valhi
Kyle Gadley, Geosyntec
Lee C. Farris, Landwell
Mark Paris, Landwell
Michael Bogle, Womble Carlyle Sandridge & Rice, LLP
Michael Long, Hargis + Associates
Nick Pogoncheff, PES Environmental, Inc.
Ranajit Sahu, BRC
Richard Pfarrer, TIMET
Rick Kellogg, BRC
Jack Luna, Tronox
John Holmstrom, Tronox
Mike Skromyda, Tronox