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December 2, 2024

Ms. Gwen Zervas
New Jersey Department of Environmental Protection
401 East State Street
Trenton, NJ 08608
Gwen.Zervas@dep.nj.gov

Dear Ms. Zervas,

The New Jersey Department of Health has prepared this letter health consultation (LHC) at your request to evaluate the potential public health implications from possible exposures to contaminants found in rock-like slag material discovered on a beach in Keyport, Monmouth County, New Jersey. This LHC was prepared under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR).

This evaluation is based on samples collected from the rock-like slag material and surrounding sand by the New Jersey Department of Environmental Protection (NJDEP) on July 29, 2024. Samples were analyzed for 23 metals including lead, arsenic, iron, copper, cobalt, and mercury. Arsenic and cobalt were the only contaminants exceeding NJDEP's Residential Soil Remediation Standards in the rock-like slag material (See Table 1). The beach sand surrounding the rock-like slag material did not contain any contaminants above the NJDEP's Residential Soil Remediation Standards.

Table 1. Contaminants Exceeding NJDEP Soil Remediation Standards – Slag Material

Contaminant	Number of Samples	Number of Detections	Maximum Concentration (mg/kg)	NJDEP Residential Soil Cleanup Standard (mg/kg)
Arsenic	10	10	128	19
Cobalt	10	10	39.4	23

Definitions: mg/kg = milligrams of contaminant per kilogram of slag material

Identifying Exposure - Exposure Pathways and Scenarios

People are exposed to an environmental contaminant through contact with the contaminant (e.g., breathing air, skin contact with a substance, or drinking a substance containing the contaminant). An exposure pathway is a series of steps starting with the release of a

contaminant in environmental media and ending at the interface with the human body. A completed exposure pathway consists of five elements:

1. Source of contamination (rock-like slag material);
2. Environmental media and transport mechanisms (beach sand);
3. Point of exposure (beach);
4. Route of exposure (ingestion); and
5. Exposed population (children and adults)

Generally, ATSDR considers three exposure categories:

a. completed exposure pathways — all five elements of a pathway are present;
b. potential exposure pathways — one or more of the elements might not be present, but information is insufficient to eliminate or exclude the element; and
c. eliminated exposure pathways — one or more of the elements is absent.

Based on the information provided by NJDEP, the beach sand surrounding the rock-like slag material did not contain elevated levels of contaminants and therefore, a completed exposure pathway does not exist. It has been noted by NJDEP that the rock-like slag material does not crumble easily. This means that people who played in the sand or who accidentally ingested sand would not be exposed as the sand did not contain contaminants from the rock-like slag material.

Exposure to the actual rock-like slag material would be another potential exposure pathway. A person could be exposed to the contaminants in the rock-like slag material by touching the material and subsequently putting their hands in their mouth, or by eating the actual rock like material. NJDOH consulted with an ATSDR subject matter expert on August 7, 2024 regarding the potential exposure pathway of people ingesting the rock-like slag material itself. ATSDR and NJDOH noted this is not a realistic exposure scenario, as it is not likely that people (including young children) are ingesting the rock-like slag material on the beach.

Out of abundance of caution, NJDOH evaluated the potential for harmful health effects by assuming that children and adults can ingest the rock-like slag material. NJDOH assumed people access the beach and ingest the rock-like slag material for three months over a one-year period. NJDOH also included a scenario for people with pica behaviors. Pica is defined as the consumption of nonfood items. Soil-pica is the ingestion of large amounts of soil. Soil-pica behavior is most likely to occur in preschool children as part of their normal exploratory behavior. Children between the ages of 1 and 2 years have the greatest tendency for soil-pica behavior, which diminishes as they age.

To determine the risk for harmful health effects other than cancer, NJDOH calculated exposure doses for arsenic and cobalt and compared these doses to the ATSDR Minimal Risk Levels (MRL). NJDOH used the maximum concentrations of arsenic and cobalt found in the material which implies a “worst-case” scenario for these calculations.

MRLs identify exposures that could be potentially hazardous to human health. MRLs can be set for three different time periods depending on the length of time people are exposed to the substance:

- acute (about 1 to 14 days),
- intermediate (from 15-364 days), and
- chronic (exposure for more than 365 days)

Exposure above the MRLs (for the relevant time period) does not necessarily mean that health problems will occur. An MRL is an estimate of the amount of a chemical a person can breathe, eat, or drink each day without a detectable non-cancer risk to health.

MRLs are based on toxicological studies in animals and on reports of human occupational (workplace) exposures. MRLs are usually extrapolated doses from observed effect levels in animal toxicological studies or occupational studies. They are adjusted by a series of uncertainty factors or through the use of statistical models. In toxicological literature, observations might be reported as

- No-observed-adverse-effect level (NOAEL): A NOAEL is the ***highest*** tested dose of a substance that has been reported to have ***no*** harmful health effects on people or animals.
- Lowest-observed-adverse-effect level (LOAEL): A LOAEL is the ***lowest*** tested dose of a substance that has been reported to ***cause*** harmful health effects in people or animals.

To provide perspective on the potential for health effects, a calculated exposure dose is compared to the MRL and the applicable NOAEL or LOAEL. As the exposure dose increases beyond the MRL and approaches the level of the NOAEL and/or LOAEL, the likelihood of adverse health effects increases.

Exposure doses were calculated for adults and children ages birth through less than 21 years using ATSDR's Public Health Assessment Site Tool (PHAST). Non-cancer health effects were assessed by comparing the calculated exposure doses for arsenic and cobalt to the ATSDR MRL via a ratio known as the "hazard quotient (HQ)." The hazard quotient is defined as the calculated exposure dose divided by the ATSDR MRL. As the hazard quotient increases above 1.0, the potential for harmful effects increases and further evaluation is warranted. Harmful noncancer health effects are not expected for hazard quotients below 1.0.

Tables 2 and 3 summarize the calculated exposure doses and hazard quotients for children and adults for arsenic and cobalt. In order to be conservative, NJDOH used the chronic duration MRL when available. A chronic MRL is not available for cobalt and therefore the intermediate duration MRL was used. The exposure doses for children in Tables 2 and 3 represent the most sensitive age group, which is children ages birth to less than one year old. As shown in the tables, harmful noncancer health effects are not expected from exposures to arsenic and cobalt in the slag material.

Table 2. Exposure Doses and Hazard Quotients for Arsenic in Slag Material

Exposure Group	Maximum Arsenic Concentration (mg/kg)	Exposure Dose (mg/kg/day)	Chronic MRL (mg/kg/day)	Hazard Quotient (HQ)	Potential for noncancer health effects
Child (birth to < 1 year)	128	0.00016	0.0003	0.54	No (HQ < 1)
Adult	128	0.000011	0.0003	0.038	No (HQ < 1)

Definitions: mg/kg = milligrams of arsenic per kilogram of slag material; mg/kg/day = milligrams of arsenic per kilogram body weight per day; HQ = hazard quotient = exposure dose/chronic MRL; Example HQ calculation using child exposure group = 0.00016/0.003=0.54

Table 3. Exposure Doses and Hazard Quotients for Cobalt in Slag Material

Exposure Group	Maximum Cobalt Concentration (mg/kg)	Exposure Dose (mg/kg/day)	Intermediate MRL (mg/kg/day)	Hazard Quotient (HQ)	Potential for noncancer health effects
Child (birth to < 1 year)	39.4	0.00033	0.03	0.011	No (HQ < 1)
Adult	39.4	0.000022	0.03	0.00073	No (HQ < 1)

Definitions: mg/kg = milligrams of cobalt per kilogram of slag material; mg/kg/day = milligrams of cobalt per kilogram body weight per day; HQ = hazard quotient = exposure dose/chronic MRL; Example HQ calculation using child exposure group = 0.00033/0.03=0.011

As mentioned earlier, NJDOH evaluated the pica exposure scenario for preschool aged children who may exhibit soil pica behaviors. The soil-pica scenario assumes preschool aged children ingest the maximum concentration of arsenic and cobalt in the slag material three times per week on the Keyport Beach. NJDOH compared the exposure doses for the pica scenario to the acute (weekly) or intermediate (monthly) duration MRL. Tables 4 and 5 summarize the soil pica exposure doses and hazard quotients for arsenic and cobalt. As shown in the tables, the soil pica hazard quotient for arsenic is elevated and is further evaluated for potential noncancer health effects. The soil pica hazard quotient for cobalt was not elevated and therefore harmful noncancer health effects are not expected.

Table 4. Soil-Pica Exposure Doses and Hazard Quotients for Arsenic in Slag Material

Exposure Group	Maximum Arsenic Concentration (mg/kg)	Exposure Dose (mg/kg/day)	Acute MRL* (mg/kg/day)	Hazard Quotient (HQ)	Potential for noncancer health effects
1 to < 2 years	128	0.015	0.005	2.9	**Yes (HQ > 1)**
2 to < 6 years	128	0.0096	0.005	1.9	**Yes (HQ >1)**

Definitions: mg/kg = milligrams of arsenic per kilogram of slag material; mg/kg/day = milligrams of arsenic per kilogram body weight per day; HQ = hazard quotient = exposure dose/MRL; * An intermediate MRL is not available for arsenic, so the acute MRL was used; Example HQ calculation for arsenic using children ages 1 to < 2 years; 0.015/0.005 = 2.9

Table 5. Soil-Pica Exposure Doses and Hazard Quotients for Cobalt in Slag Material

Exposure Group	Maximum Cobalt Concentration (mg/kg)	Exposure Dose (mg/kg/day)	Acute/Intermediate MRL (mg/kg/day)*	Hazard Quotient (HQ)	Potential for noncancer health effects
1 to < 2 years	39.4	0.0074	0.03	0.25	No (HQ < 1)
2 to < 6 years	39.4	0.0049	0.03	0.16	No (HQ< 1)

Definitions: mg/kg = milligrams of cobalt per kilogram of slag material; mg/kg/day = milligrams of cobalt per kilogram of body weight per day; HQ = hazard quotient = exposure dose/MRL; *Acute and intermediate MRL are the same for cobalt; Example HQ calculation using children ages 1 to < 2 years; 0.0074/0.03 = 0.25

As shown in Table 4 above, the hazard quotients for arsenic were elevated for children with soil-pica behaviors. The acute MRL for arsenic was derived from a study summarizing an outbreak of acute arsenic poisoning where 220 people ingested arsenic contaminated soy sauce in Japan. The researchers determined the LOAEL to be 0.05 mg/kg/day for gastrointestinal effects (nausea, vomiting, diarrhea). An uncertainty (safety) factor of 10 was applied to account for human variability and for the use of a LOAEL to obtain the acute MRL of 0.005 mg/kg/day.

The maximum calculated exposure dose for children with soil-pica behaviors is 0.015 mg/kg/day which is below the LOAEL of 0.05 mg/kg/day. Therefore, children with soil pica behaviors are not likely to experience gastrointestinal effects from exposures to arsenic in the slag material. It is important to note that using the maximum arsenic concentration in the slag material for this evaluation is not realistic because children are not likely ingesting the slag material. In addition, the beach sand around the slag material which children are more likely to ingest while playing on the beach did not contain elevated levels of contaminants.

Cancer Evaluation

Arsenic is the only carcinogen exceeding NJDEP's Residential Soil Cleanup Standard for the slag material. Several studies have shown that ingestion of arsenic can increase the risk of skin cancer and cancer in the liver, bladder, and lungs. The U.S. Department of Health and Human Services (DHHS) and the U.S. Environmental Protection Agency (USEPA) have determined that arsenic is a known human carcinogen. The International Agency for Research on Cancer (IARC) has determined that arsenic is carcinogenic to humans.

NJDOH evaluates the potential for cancer health effects by assessing the excess cancer risk relating to exposure over the background cancer risk. In New Jersey, approximately 45% of women and 47% of men (about 46% overall) will be diagnosed with cancer in their lifetime (NJDOH 2023). This is referred to as the "background cancer risk."

The term "excess cancer risk" represents the risk on top of the background cancer risk and is referred to as the Lifetime Excess Cancer Risk, or LECR. An LECR of "one-in-a-million" (1/1,000,000 or 10^{-6} cancer risk) means that if one million people are exposed to a cancer-causing substance at a certain level for a period of time, then one cancer above the background number of cancers may develop in those one million people over the course of their lifetime (considered 78 years).

To put the LECR of 10^{-6} in context of New Jersey's background cancer risk, the number of cancers expected in one million people over their lifetime is 460,000 (46%) in New Jersey. If these one million people are all exposed to a cancer-causing substance for a specific duration, then 460,001 people may develop cancer instead of the expected 460,000 over the course of their lifetime (78 years).

NJDOH follows ATSDR's guidelines to evaluate theoretical cancer risks from environmental exposures (ATSDR 2022). A **concern for an increased risk** is categorized as an excess of one or more additional cancer cases per 10,000 people (expressed as risk in "the $1x10^{-4}$ range" or higher). This is a theoretical estimate of cancer risk that NJDOH and ATSDR use as a tool for deciding whether public health actions are needed to protect health. It is not an actual estimate of cancer cases in a community and is not a prediction that cancer will occur.

NJDOH and ATSDR categorize **no concern for an increased risk** to include risks in the range between one and nine additional cancer cases per 100,000 people (expressed as "the $1x10^{-5}$ range") and an even lower risk is represented by the range between one and nine additional cancer cases per one million people (expressed as "the $1x10^{-6}$ range").

Cancer risk was evaluated for arsenic using the same exposure parameters used for noncancer health effects. NJDOH assumed people access the beach and ingest the rock-like slag material for three months over a one-year period. The LECR for arsenic was calculated for children and adults using ATSDR's PHAST tool and incorporating USEPA's cancer slope factor. The cancer slope factor is defined as the slope of the dose-response curve obtained from animal and/or human cancer studies. It is expressed as the inverse of the daily exposure dose: $(mg/kg/day)^{-1}$.

As shown in Table 6, the calculated LECR for children is approximately three in one million similarly exposed people. The calculated LECR for adults is less than one in one million similarly exposed people. **These LECRS represent no concern for an increased theoretical cancer risk.**

Table 6. LECRs for Exposures to Arsenic in Slag Material

Exposure group	Maximum arsenic concentration (mg/kg)	Exposure dose (mg/kg/day	Exposure duration (years)	Average lifetime (years)	Cancer slope factor $(mg/kg/day)^{-1}$	LECR
Birth to < 1 year *	128	0.00016	1	78	1.5	3.1×10^{-6}
Adult	128	0.000011	1	78	1.5	2.2×10^{-7}

Definitions: mg/kg = milligrams of arsenic per kilogram of slag material; mg/kg/day = milligrams of arsenic per kilogram body weight per day; LECR = lifetime excess cancer risk; *Represents most sensitive age group with maximum exposure dose for one year exposure duration; Example LECR calculation for children = exposure dose x exposure duration/average lifetime x cancer slope factor = $0.00016 \times 1/78 \times 1.5 = 3.1 \times 10^{-6}$.

Conclusion:

Based on the information available to NJDOH, harmful health effects are not expected from exposures to contaminants in the slag material on Keyport Beach. It is not likely that people

are ingesting the slag material. In the unlikely event people have ingested the slag material, the calculated exposure doses are below noncancer health guidelines (MRLs) or below levels where harmful health effects were observed in toxicological studies. In addition, the calculated LECRs show no concern for an increased theoretical cancer risk.

NJDOH supports NJDEP's efforts to post signs around the area where the slag material is present to inform the public to avoid these areas. Additionally, people should take measures to protect themselves from exposures, such as avoiding contact with the material by not touching it or eating it, and by washing hands after playing at the beach and before eating or drinking. Please feel free to contact me with any questions or concerns at 609-826-4984 or by email at Christa.Fontecchio@doh.nj.gov. You may also refer any concerned residents to us as well.

Sincerely,

Christa Fontecchio

Christa Fontecchio, M.P.H.
Environmental and Occupational Health Surveillance Program
New Jersey Department of Health

c: Leah Graziano, R.S. Regional Director, ATSDR Region 2

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Non-Certified

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Protect yourself and your family from rock-like slag material found on the beach in Keyport, Monmouth County

The New Jersey Department of Health (NJDOH) developed this fact sheet to address community concerns about possible exposures to the rock-like slag material recently found on the beach in Keyport.

What is the status of evaluation of the rock-like slag material found at Keyport beach?

Rock-like slag materials were first discovered at the beach in June of 2024, and additional materials were discovered in July. The New Jersey Department of Environmental Protection (NJDEP) has been removing the material as it continues to wash up on the beach and has conducted sampling to test for heavy metals, including lead and arsenic. NJDEP has posted signs in the area to warn people to not touch or eat the material and is currently investigating the source of the material. On August 5, 2024, NJDEP contacted NJDOH and requested assistance in evaluating the potential public health implications from possible exposures to contaminants found in this material.

What was detected in the rock-like slag material and the surrounding sand?

NJDEP has conducted sampling of the rock-like slag material and the surrounding sand. A majority of the rock-like slag samples had detections of arsenic above NJDEP's cleanup standard. Two of the 10 samples had cobalt levels slightly elevated above the cleanup standard. Lead was not detected above the cleanup standard in any of the collected samples.

Sampling of the beach sand surrounding the rock-like slag material showed no contaminants detected above NJDEP's cleanup standards. NJDEP's cleanup standard is a level at which actions must be taken to remove contaminated soil/ rock-like slag material.

What is Arsenic?

Arsenic is a naturally occurring heavy metal found in the earth's crust. Prior to 2003, arsenic was used in the production of wood preservatives, primarily copper chromated arsenate (CCA); wood preservatives containing arsenic have been phased out for certain wood products. Elemental arsenic is used as an alloying element in ammunition and solders, as an anti-friction additive to metals used for bearings, and to strengthen lead-acid storage battery grids. At this time, the source of the rock-like slag materials found on the beach in Keyport is unknown.

What is cobalt?

Cobalt is a naturally occurring element found in rocks, soil, water, plants, and animals. Alloys produced with cobalt metal are used in the manufacture of aircraft engines, magnets, grinding and cutting tools, and medical devices and prosthetics. Cobalt compounds are used to color glass, ceramics, paints, and cosmetics. As noted above, the source of the rock-like slag materials found

on the beach in Keyport is unknown.

How can you be exposed to contaminants from the material found on the beach in Keyport?

In order for contaminants to impact human health, there needs to be an exposure pathway, such as eating or inhaling contaminants.

In general, exposure to sand would be the most likely way that individuals on the beach could accidentally ingest contaminants while playing or digging in the sand if the sand contained contaminants from the rock-like slag material. However, the sand was sampled by NJDEP and results indicated there were no elevated levels of heavy-metal contaminants in the sand. NJDEP noted that the rock-like slag material does not crumble easily. Based on the sampling results of the sand, people who played in the sand or who ate sand would **not** be exposed.

Exposure to the actual rock-like slag material would be another potential exposure pathway. A person could be exposed to the contaminants in the rock-like slag material by touching the material and then putting their hands in their mouth, or by eating the actual rock-like material.

In summary, based on the information provided to NJDOH, people could have been exposed at the beach in Keyport through direct contact to the actual rock-like slag materials but people could not be exposed to contaminants by just having contact with the sand.

How can you protect yourself and your family from exposure from contaminants in the rock-like slag material on the beach in Keyport?

- Avoid contact with the material by not touching it or eating it.
- Wash hands after playing at the beach and before eating or drinking.

What can you do if you think you or your child may have touched or accidentally ingested rock-like slag fragments from the beach in Keyport?

NJDOH is evaluating the potential public health implications from possible exposures to contaminant in this material. More information on potential health impacts will be included in a report. This work is being done under a cooperative agreement between NJDOH and the federal Agency for Toxic Substances and Disease Registry (ATSDR). Any questions or concerns about exposures to arsenic or cobalt from this material can be directed to Christa Fontecchio or Somia Aluwalia at 609-826-4984 or by email at Christa.Fontecchio@doh.nj.gov and Somia.Aluwalia@doh.nj.gov.

Protéjase y proteja a sus familiares del material de desecho en forma de rocas encontrado en las playas de Keyport en el condado de Monmouth

El Departamento de Salud de Nueva Jersey (NJDOH, por sus siglas en inglés) elaboró la presente hoja informativa para abordar temas de preocupación comunitaria sobre las posibilidades de exposición a material de escoria en forma de rocas que hace poco se encontró en las playas de Keyport.

¿Cuál es la situación actual con respecto a la evaluación de las rocas de escoria que se encontraron en las playas de Keyport?

Se encontraron rocas de escoria en las playas por primera vez en junio de 2024 y se encontró más material de escoria en julio. El Departamento de Protección Ambiental de Nueva Jersey (NJDEP, por sus siglas en inglés) está en el proceso de eliminar el material de escoria que las corrientes sigen arrastrando a la costa. El NJDEP tomó muestras para analizar y detectar metales pesados, como plomo y arsénico, entre otros y colocó letreros en la zona para advertir a las personas que no se debe tocar ni ingerir el material de escoria en forma de rocas. Por el momento, el NJDEP realiza estudios para determinar la procedencia del material de escoria. El 5 de agosto de 2024, el NJDEP pidió la ayuda del NJDOH para evaluar las implicaciones potenciales para la salud pública de la posible exposición a los contaminantes en el material de escoria.

¿Qué se halló en las rocas de escoria y en la arena?

El personal del NJDOH tomó muestras de las rocas de escoria y la arena circundante. Según la norma de limpieza del NJDEP, en la mayoría de las muestras analizadas se detectó arsénico en concentraciones superiores a los límites establecidos, en dos de las 10 muestras analizadas se detectó cobalto en concentraciones ligeramente superiores a los límites establecidos, y en ningunas de las muestras analizadas se detectó plomo en concentraciones superiores a los límites establecidos.

En la arena alrededor de las rocas de escoria en las playas no se detectaron contaminantes en concentraciones superiores a los límites establecidos por la norma de limpieza del NJDEP. La norma exige que se tomen acciones para eliminar las rocas de escoria y los suelos contaminados siempre que se superen los límites establecidos.

¿Qué es el arsénico?

El arsénico es un metal pesado natural presente en la corteza terrestre. Antes de 2003, el arsénico fue empleado en la elaboración de conservantes de madera, sobre todo el arseniato de cobre cromatado. Se han ido eliminando progresivamente de determinados productos de madera los conservantes de madera con arsénico. Se utiliza el arsénico elemental como elemento de aleación en municiones y soldaduras, como aditivo antifricción en metales de rodamientos y para reforzar rejillas en baterías de acumuladores de plomo-ácido. Hasta el momento, se desconoce la procedencia de las rocas de escoria en las playas de Keyport.

¿Qué es el cobalto?

El cobalto es un elemento natural presente en suelos, rocas, aguas, plantas y animales. Se utilizan las aleaciones producidas con cobalto metálico en la fabricación de motores de aviación, imanes, herramientas de esmerilado y corte, dispositivos médicos y prótesis. Se utilizan los compuestos de cobalto en la coloración de vidrios, objetos de cerámica, pinturas y cosméticos. Como ya se indica antes, se desconoce la procedencia de las rocas de escoria en las playas de Keyport.

¿Cómo puede ocurrir la exposición a los contaminantes en el material de escoria encontrado en las playas de Keyport?

Para que los contaminantes tengan un impacto sobre la salud humana, tiene que existir una vía de exposición, como la ingestión o inhalación.

Por lo general, la vía de exposición más probable para las personas que frecuentan las playas es la ingestión accidental de arena al jugar o cavar pozos en la arena, si la arena contiene contaminantes provenientes del material de escoria. Sin embargo, los análisis de las muestras de arena tomadas por el NJDEP no han revelado concentraciones elevadas de metales pesados. El NJDEP destaca que por lo general es difícil que las rocas de escoria se partan o desmoronen. En base a los resultados del muestreo de arena, las personas que jugaron en la playa o que ingirieron la arena **no** podrían haber estado expuestas.

Otra vía de exposición posible es por medio del contacto directo con las rocas de escoria. Por ejemplo, podrían haber estado expuestas las personas que tocaron las rocas de escoria y luego tocaron su boca con sus manos, o que ingirieron las rocas de escoria.

En resumen, según la información proporcionada al NJDOH, las personas en las playas de Keyport pudieron haber estado expuestas por contacto directo con las rocas de escoria, pero no por contacto con la arena.

¿Cómo protegerse a sí mismo y a los familiares de la exposición a los contaminantes en las rocas de escoria en las playas de Keyport?

- Evitar el contacto con el material de escoria; no tocarlo ni ingerirlo
- Lavarse las manos después de jugar en la playa y antes de comer o beber

Si usted cree que usted o su hijo han tocado o ingerido por accidente fragmentos de rocas de escoria en las playas de Keyport, ¿qué puede hacer?

En el NJDOH se estudian las implicaciones potenciales para la salud pública de la posible exposición a los contaminantes que hay en el material de escoria. Se incluirá información más detallada en un informe que se realiza bajo un acuerdo cooperativo entre el NJDOH y la Agencia para Sustancias Tóxicas y el Registro de Enfermedades (ATSDR). Las preguntas o dudas sobre la exposición al arsénico o al cobalto en el material de escoria deben dirigirse a Christa Fontecchio o a Somia Aluwalia al 609-826-4984 o por correo electrónico a Christa.Fontecchio@doh.nj.gov y Somia.Aluwalia@doh.nj.gov.