Environmental Appeal Board

Citation: *Brookswood Fernridge Community Association et al. v. Director, Environmental Management Act*, 2026 BCEAB 19

Appeal No.: 2018-EMA-005, 2018-EMA-006, 2018-EMA-007, 2018-EMA-009, 2018-EMA-010, 2018-EMA-011, 2018-EMA-012, 2018-EMA-013, 2018-EMA-014, 2019-EMA-003, 2019-EMA-005, EAB-EMA-20-A011, EAB-EMA-20-A012, EAB-EMA-20-A013, EAB-EMA-20-A014, EAB-EMA-20-A015, EAB-EMA-20-A016, EAB-EMA-20-A017, EAB-EMA-20-A018 [Collectively, 2018-EMA-G01]

Decision Date: 2026-03-27

Method of Hearing: Conducted by way of an oral hearing and written submissions concluding on March 22, 2024

Decision Type: Final Decision

Panel: Darrell LeHouillier, Panel Chair
Maureen Baird, Panel Member
Howard Saunders, Panel Member

Appealed Under: *Environmental Management Act,* SBC 2003, c. 53

Between:

Brookswood Fernridge Community Association, Nicomekl Enhancement Society, Little Campbell Watershed Society, Semiahmoo Fish and Game Club, Bill Ridge, Sonja Kroecher, Frank P. Mueggenburg, Gabriel Farms Ltd., Irongait Ventures Inc., Carl and Inge Thielemann

Appellants

And:

Director, *Environmental Management Act*

Respondent

And:

Ebco Metal Finishing L.P.

Third Party

Appearing on Behalf of the Parties:

For the Appellants:	Murray McFadden, Philip Milligan, John Hewitt, Terry McNeice, Bill Ridge, Sonja Kroecher, Frank P. Mueggenburg, Chris and Shari Tompe, Dianne Orringe, Carl and Inge Thielemann
For the Respondent:	Susan Rutherford, Counsel
For the Third Party:	Nicholas Hughes and Katherine Booth, Counsel

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FINAL DECISION

APPEALS

[1] On March 28, 2018, Ray Robb, the District Director (the "District Director") for the Greater Vancouver Regional District ("Metro"), issued Permit GVA1093 (the "Permit"). The Permit authorizes the release of certain contaminants into the air by a hot dip zinc galvanizing facility located at 18699 25 Avenue, Surrey, BC (the "Facility"). The Facility is owned and operated by Ebco Metal Finishing L.P. ("Ebco").

[2] The Permit was issued under section 14 of the *Environmental Management Act*, S.B.C. 2003, c. 53 (the "*Act*"), and the Greater Vancouver Regional District Air Quality Management Bylaw No. 1082, 2008 (the "Bylaw"). The Permit has been amended twice, and each iteration has been appealed to the Environmental Appeal Board (the "Board") by various appellants.

[3] The appellants to these appeals are: the Nicomekl Enhancement Society (the "NES"), the Little Campbell Watershed Society (the "LCWS"), the Semiahmoo Fish and Game Club (the "SFGC"), Gabriel Farms Ltd. ("Gabriel Farms"), Shari Tompe, Inga and Carl Thielemannn (who jointly filed one notice of appeal), the Brookswood Fernridge Community Association (the "BFCA"), Sonja Kroecher, Frank Mueggenburg, and IronGait Ventures Inc. ("IronGait").

[4] All appellants are individuals, corporations, or other entities that reside, do business, or operate in the area of projected impact from the Facility's emissions. Representatives for the various appellants have shifted over time, such that representatives at times appeared for one appellant and later for another, or for multiple appellants for limited times during the hearing of these appeals.

[5] While initially they sought different remedies from this appeal and took different positions on various preliminary issues, over the course of the hearing for these appeals the appellants aligned in interests and provided submissions on the merits of the appeal collectively. For ease and simplicity, the panel refers to them collectively in this decision, other than for the purposes of describing their testimony or their individual roles in the history of the Facility. The appellants ask the Board to rescind the Permit or to vary it along specific terms.

[6] During these prolonged and complicated appeals, Mr. Robb retired from his position as the District Director. He was succeeded by Dr. Kathy Preston, P. Eng., who formerly had been a Senior Engineer and the Assistant District Director with Metro. When discussing the District Director as a party to these appeals, we refer to District Director as referring to either or both. When summarizing the involvement or evidence of either of the District Directors, we refer to them by name.

ISSUES

[7] The main issue in this appeal is whether the Board should confirm, vary, or rescind the various iterations of the Permit that have been appealed. As described below, this issue involves consideration of whether the 2018 version of the Permit, the 2019 version of the Permit, and the 2020 version of the Permit are sufficiently protective of human health and the environment and whether they allow Ebco to cause pollution.

BACKGROUND

Statutory Framework

The Environmental Management Act

[8] The *Act* regulates the introduction of waste (including air contaminants[1]) into the environment. The *Act* uses terms that have particular meanings in this context, defined by section 1 of the *Act*. Several are relevant to this appeal:

- "air contaminants" means substances introduced into the air and that:
    a. injures or is capable of injuring the health or safety of a person,
    b. injures or is capable of injuring property or any life form,
    c. interferes or is capable of interfering with visibility,
    d. interferes with or is capable of interfering with the normal conduct of business,
    e. causes or is capable of causing material physical discomfort to a person, or
    f. damages or is capable of damaging the environment; and

- "pollution" means the presence in the environment of substances or contaminants that substantially alter or impair the usefulness of the environment.

[9] Section 14 of the *Act* allows a director appointed under the *Act*—including a District Director from Metro[2]—to issue a permit authorizing the introduction of air contaminants into the environment, subject to requirements that the director considers advisable for the protection of the environment. Such a permit may not be issued for the introduction of waste into the environment where that waste is governed by:

[1] S. 1 of the *Act*.

[2] S. 1 and 31 of the *Act*.

(a) a code of practice established in regulations under the *Act*, in relation to the industry, trade, or business that applies for a permit;

(b) a code of practice established in regulations under the *Act*, in relation to activities or operations for which a permit is sought; or

(c) a regulation, unless the regulation requires that a permit be obtained in relation to the discharge of the industry, trade, business, activity, or operation.

[10] Section 15 of the *Act* allows a director appointed under the *Act* to issue an approval for the introduction of waste into the environment for up to 15 months. Such an approval may be subject to requirements that the director considers advisable for the protection of the environment.

[11] Section 16 of the *Act* allows a director to amend a permit issued under section 14, on the director's own initiative if they consider it necessary for the protection of the environment, or on application by the holder of a permit, for the protection of the environment.

[12] Section 31(1) of the *Act* delegates to Metro the ability to "… provide the service of air pollution control and air quality management." The section grants Metro the power to enact bylaws to "… prohibit, regulate and otherwise control and prevent the discharge of air contaminants."

[13] A right of appeal exists for any person aggrieved by a decision of a director or district director under the *Act*, pursuant to section 100(1) of the *Act*. The remedies available are defined in section 103:

> On an appeal … the appeal board may
>
> a. send the matter back to the person who made the decision, with directions,
> b. confirm, reverse or vary the decision being appealed, or
> c. make any decision that the person whose decision is appealed could have made, and that the appeal board considers appropriate in the circumstances.

The Air Emissions Bylaw

[14] Using the power provided in section 31(1) of the *Act*, Metro enacted the Bylaw. Section 5 of the Bylaw prohibits the discharge of air contaminants unless authorized by section 7 of the Bylaw (which incorporates authorization by way of regulations under the *Act*). These authorizations remain subject to section 10 of the Bylaw, which prohibits the discharge of, or allowing anyone to discharge, air contaminants to cause pollution.

[15] Air contaminants and pollution are defined in section 3 of the Bylaw just as they are defined in the *Act*.

[16] Section 3 of the Bylaw further defines the environment as "air, land, water and all other external conditions or influences under which humans, animals and plants live or are developed."

[17] Section 11 of the Bylaw authorizes the District director to issue permits authorizing the emission of air contaminants into the environment, "subject to requirements for the protection of the environment that the district director considers advisable." Such permits may be amended under section 14 of the Bylaw, either on the district director's initiative "where the district director considers it necessary for the protection of the environment" or on application by a holder of a permit.

The Facility and the Site

[18] The Facility is a hot dip zinc galvanizing plant, located in an industrial park zoned for "light impact industry" but across a street from an agricultural land reserve. It is on a property with residential address 18699 25th Avenue, Surrey, British Columbia (the "Site").

[19] Stormwater management at the Site is in accordance with the City of Surrey's Stormwater Management Plan. Of importance to these appeals, there is a bioswale that runs along the western edge of the Site (the "Bioswale"). The Bioswale is essentially a vegetated ditch with a clay-based surface material. It was designed by an engineering company, Hub Engineering Inc., to effectively manage stormwater on the Site. The Bioswale includes a number of drains (the "Lawn Drains"), each designated with a number. The Lawn Drains feed into underground pipes that lead to a grit separator (the "Grit Separator"), which filters out some suspended material before stormwater progresses further into the stormwater system. Beyond the Grit Separator, stormwater flows to a flow control device accessed via a manhole (the "Flow Control Manhole"). From there, stormwater preferential travels into underground perforated pipes that allow the stormwater to flow into the ground and recharge the Brookswood Aquifer. In the event of a one-in-one-hundred-year storm event, however, the stormwater is redirected at the Flow Control Manhole into the City of Surrey's municipal stormwater system. From there it would discharge into surface water waterways.

The Area Surrounding the Site

[20] To the south and west of the Site is a "green belt:" a strip of undeveloped, forested land (the "Green Belt"). Beyond the Green Belt to the west is undeveloped land and farmland. The land to the immediate west of the Green Belt is owned by Randy Ryzak, who is not an appellant in this case. Mr. Ryzak had attempted to appeal the first iteration of the Permit but had filed his appeal beyond the statutory due date and so was denied standing by the Board. He did not appeal later iterations of the Permit.

[21] To the west of Mr. Ryzak's property is a road, and then a farm owned by two appellants: Carl and Inga Thielemann.

[22] To the southwest of the Green Belt is a road, beyond which lies a farm where an appellant lives: Frank Mueggenberg. Mr. Mueggenberg resides with Diane Orringe, who is the principal and representative of IronGait. Although the land ownership and rental agreements are more complicated, for ease, the land is referred to in this decision as IronGait Farm.

[23] IronGait operated a horse boarding and breeding business, which relied on a large barn located on IronGait Farm. The barn housed up to 26 horses at a time, and the barn has open walls to the north and west, in the rough direction of the Facility.

[24] The barn has a steel roof, which has been replaced in sections. Drainage from this roof is discharged into ponds located nearby, which are home to a trout-raising business. In cross-examination, Mr. Mueggenberg agreed that this would have resulted in zinc from the galvanized barn roof being washed into the ponds. Surface water sampling done in 2016 indicated zinc concentrations above thresholds for freshwater aquatic life under the British Columbia Water Quality Guidelines (the "BCWQGs").[3]

[25] IronGait Farm is also home to several other money-making efforts: a cattle-raising business, a one-employee window frame assembly operation; a car purchase, repair, and sale operation; and an out-of-school or after-school program for children.

[26] Southwest of IronGait is a farm on which another corporate appellant operates Gabriel Farms Ltd. For ease, the farm on which that corporate appellant operates is referred to in this decision as Gabriel Farms.

[27] The headwaters of two creeks are in the immediate vicinity of the Facility. Erickson Creek originates on the Green Belt, the Site, Mr. Ryzak's property, or some combination of those three. Its waters flow generally north and west, to the Nicomekl River. Twin Creeks originates, in part, on IronGait Farm and on Gabriel Farms. Twin Creeks flows generally south and west, toward the Campbell River.

[28] There is another waterway further east and south of the Facility: the Little Campbell River, which joins with the Campbell River to the south of IronGait Farm and Gabriel Farms.

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[3] The BCWQGs list, for varied substances, concentrations in water at which adverse impacts may occur. There are multiple tables in which different concentrations are presented for each substance listed, depending on the type of water (groundwater or surface water) and the use of the water at issue (for example, drinking water, bearing aquatic life, and agriculture). For any given water type, water use, and substance, there may also be two different values listed, one for short-term (acute) exposure and one for long-term (chronic) exposure. The information in the BCWQGs are provincial policy used to inform water resource protection and water usage decisions in British Columbia.

[29] In and around the Facility are one or more aquifers, including the Brookswood Aquifer, which provides groundwater to a large number of residences, farms, and other entities in the area. The Brookswood Aquifer underlies the Site and is recharged, in part, by stormwater from the Site and other facilities in the area, pursuant to the City of Surrey's Stormwater Management Plan.

The Galvanizing Process at the Facility

Pre-Treatment

[30] The galvanizing process at the Facility involves dipping steel products into tanks or vats in sequence, before it is dipped in a molten zinc alloy (the "Alloy") to galvanize it. There are ten tanks at the north end of the building (the "Pre-Treatment Area"), set up in a series to make this process efficient.

[31] The tanks in the Pre-Treatment are described below, from west to east, which generally follows the sequence of steps in galvanizing done at the Facility. First is a tank that, as of 2022, was empty. It was no longer used by that time but, at some point in the past, held a phosphoric acid solution used to clean steel to be galvanized as a first step in the process. Ebco ceased using the phosphoric acid solution because it started to corrode that tank.

[32] The second tank (the "Caustic Tank") contains a heated, aqueous solution containing roughly two to three percent caustic soda by volume. Since Ebco stopped using the phosphoric acid tank, steel has first been dipped in this tank to remove dirt and oil. Such a dip takes about five minutes on average. The caustic soda needs to be replenished over time as it reacts chemically with immersed steel to remove oil and dirt.

[33] The third to seventh tanks (the "Pickling Tanks") contain a warm or hot aqueous solution (the "Pickling Solution") containing two to five percent sulphuric acid by volume used to remove rust and mill scale from steel immersed in it (a process referred to as "Pickling"). Pickling occurs to steel after it has been treated in the Caustic Tank and then rinsed off in a tank containing pure water (the "Rinse Tank"), described below. During Pickling, steel is immersed in the tank for 30 to 90 minutes. A chemical reaction occurs between the sulphuric acid, and the rust, mill scale, and steel. While the steel is cleaned, sulphuric acid is consumed, producing iron sulphates and hydrogen gas. Hydrogen gas rises to the top of the Pickling Solution and bursts, resulting in particles of Pickling Solution being suspended in the air. This process is referred to as misting. Whatever is in the Pickling Solution, including iron sulphate and sulphuric acid, may be present in the mist.

[34] The Pickling Tanks do not only mist: they also fume. This is the process by which a liquid vaporizes into the gas above it, such that the pressure between the two is in equilibrium. As the liquid is heated, or as the ambient pressure drops, the liquid fumes more, until it reaches the boiling point. At the temperatures and pressures involved in this

case, only water fumes from the Pickling Solution: the sulphuric acid and other contaminants remain in solution, at least so long as water is present.

[35] Over time, more acid must be added to the Pickling Tanks to replace that which was consumed and that which was lost through misting. Furthermore, iron sulphate accumulates in the solution and decreases the efficiency of the Pickling. As needed, individual Pickling Tanks can be cooled down so that the iron sulphate precipitates and can then be removed to be sold as a byproduct of the operation.

[36] To reduce misting, Ebco uses two additives to the Pickling Tank. First is a de-misting agent ("Anti-Vapour"), which reduces the size and number of hydrogen bubbles generated, and so the quantity of mist generated. Second is Ironsave, a chemical which slows the chemical reactions in the Pickling Tank, thereby reducing the amount of hydrogen bubbles and, as a result, mist that is generated. According to Ebco, these additives reduce sulphuric acid emissions from the Pickling Tanks by 70 to 80 percent.

[37] Of the Pickling Tanks, one (the fifth from the west side of the Facility) is dedicated to the removal of zinc from steel ("Stripping"). Stripping is done to correct errors in the galvanizing process or to remove zinc from chains or a rack that lowers and raises steel into the galvanizing tank, described later. The tank in which Stripping occurs (the "Stripping Tank") contains sulphuric acid like the other Pickling Tanks but is kept at a lower temperature to further slow the chemical reactions. According to Ebco, the slower reaction rate works better for the removal of zinc from the items to be stripped. Stripping typically takes four to five hours.

[38] Because the Stripping Tank involves a reaction between sulphuric acid and galvanized product, it may generate byproducts other than hydrogen gas (which, as described later, creates bubbles, which burst and produce a mist of the solution) and iron sulphate. As it removes the galvanized coating from the steel, it also creates zinc sulphate and nickel sulphate. It may also remove ammonium chloride residue from the galvanizing process, but the precise reactions were not described by any expert witness certified by the Board.

[39] Ebco checks iron, zinc, and sulphuric acid levels in the Pickling Tanks (including the Stripping Tank) weekly to ensure the concentrations remain appropriate for Pickling and Stripping.

[40] The eighth tank is typically empty but sometimes contains sulphuric acid when acid recovery is ongoing. Ebco did not describe emissions associated with this tank and the Appellants did not argue that it generated air contaminants that were later discharged into the environment.

[41] The ninth tank is the Rinse Tank. Its water is kept at room temperature. It is used to rinse caustic solution from steel before Pickling and acid from steel after Pickling. After its second rinse, the steel is then allowed to air dry before it moves on in the process.

[42] The last tank (the "Flux Tank") contains a heated zinc ammonium chloride flux solution ("Flux"), which prevents oxidization and promotes adhesion during galvanizing. Steel is dipped into the Flux Tank for anywhere from one to eight minutes, then is left to air dry above the Flux Tank, above a lined empty pit, or both. Above or in the empty pit, the steel is transferred from a crane that has carried it from tank to tank in the Pre-Treatment Area to a monorail that carries it out of the Pre-Treatment Area.

[43] The tanks in the Pre-Treatment Area require, on average, the introduction of one to three inches of water per day, and up to six inches of water over a weekend, to maintain a consistent volume. These tanks range in size from 43 to 55 feet-long and from 4.2 to 5.5 feet-wide. When the Facility is not actively operating, some tanks in the Pre-Treatment Area are covered to minimize heat loss.

[44] Workers at the Facility are not required to wear any personal protective equipment to safeguard them against any chemical exposures. Employees wear masks and protective equipment while removing skimmings from the Galvanizing Tank (the "Skimmings"), which contain zinc oxide, iron oxide, and ammonium chloride, but inspections of the Facility carried out by WorkSafeBC and the Manufacturing Safety Alliance of BC ("MSABC") indicated no potential for overexposure for workers in the Facility, from ammonium chloride in the Flux or sulphuric acid in the Pickling Solution.

Hot Dip Galvanizing

[45] After the steel is ready for galvanizing, it is dipped in the Alloy, which is nearly pure zinc. The secondary component is nickel. According to fourteen assays of shipments of zinc ingots that also contained ingots to be added to the Alloy, tested between November 2017 and November 2018, trace impurities, including anywhere from 0.0015% to 0.0033% lead by weight, may also be present. The Alloy is consistently over 99.9% zinc by weight.

[46] Aided by a chemical reaction with the Flux, the Alloy coats the steel. This dipping and adhesion will be referred to as "Galvanizing" in this decision. Galvanizing is done in an enclosed tank (the "Galvanizing Tank"). During Galvanizing, a metal enclosure (the "Kettle") is fitted around the Galvanizing Tank. Fans draw exhaust from the Kettle through ductwork for eventual discharge into the environment. The process of submerging the steel into the Alloy typically takes two to three minutes, although for some dips, quicker submersion is required. In "technical dips," where Galvanizing is done up to a maximum thickness of Alloy, the whole Galvanizing process must be done within roughly four minutes.

[47] During Galvanizing, some of the Flux reacts with the Alloy to create the Skimmings, usually within the first two minutes of a dip while the steel is both being submerged and is submerged, and float to the surface of the Alloy. These Skimmings, if left in place, would stick to the galvanized steel when it is withdrawn from the molten Alloy.

[48] To address this, production staff open one or more side doors of the Kettle to remove the Skimmings while Galvanizing is underway but after most of the smoke created

from the Flux's interaction with the Alloy (the "Smoke"), which contains ammonia, ammonium chloride, chlorine, hydrogen chloride, nickel, zinc, and other particulate matter, has been drawn out as exhaust from the Kettle. Once removed, Skimmings are set aside.

[49] The Kettle has various doors or vents that can be opened or closed before, during, and after Galvanizing, as operations require. The removal of Skimmings is one such operation. Another is "over-length dips," where steel parts are too long to fit within the Galvanizing Tank, and so require doors at one of the ends of the Kettle to be open during Galvanizing so that the steel can be dipped one side at a time. When an over-length dip is underway, Ebco uses heavy curtains to extend the Kettle around the end of the steel being Galvanized, although the efficiency of emissions containment may not be the same as for Galvanizing with the ends of the Kettle closed around the Galvanizing Tank.

[50] Following assessments of the Facility, WorkSafeBC and the MSABC concluded there was no risk of overexposure to metal particulate for workers from the Kettle.

[51] When the Galvanizing Tank is not in use, it is kept covered by the Kettle and remains heated.

[52] Precise amounts of various additional metals must be added to the Alloy every day or two in order to maintain a suitable proportion of these metals in the Alloy. There is no chemical reaction when these metals are added: the metals simply melt when placed inside the Galvanizing Tank.

Post-Galvanizing

[53] After Galvanizing, the galvanized steel is left to cool in ambient room air. It may require grinding, filing, or fettling to remove any drips or irregularities on the finalized product. This is done at the south end of the building and generates zinc filings. Historically, these tended to stick to forklift tires that circulated in the area and would be transported along the ground in the Facility and out in the paved yard on the Site.

[54] Ungalvanized steel is stored onsite before it is galvanized, and galvanized steel is stored onsite until it is shipped to customers. Such material may be stored inside the Facility or outside on the Site, as operations require. Scrap metal generated in this process is typically stored outdoors, on the Site, until removed.

Emissions from the Facility

[55] The Facility features two sources of air contaminants that are the subject of these appeals. Under the Permit, they are named Emissions Source 01 ("ES01") and Emissions Source 02 ("ES02").

ES01

[56] ES01 is a set of stacks located on the west side of the building, from which exhaust from Galvanizing is discharged into the environment.

[57] During Galvanizing, Flux on the steel vaporizes, producing the Smoke. The Smoke is evacuated from the Kettle in three to six minutes for normal dips, which involve Galvanizing at or beyond a specified minimum thickness of Alloy. Skimmings continue to produce Smoke even after they are removed from the Galvanizing Tank.

[58] Emissions from Galvanizing are intended to be captured in the Kettle, even with some doors opened. To accomplish this, the suction from the exhaust system must create a low enough pressure within the Kettle that the Smoke is drawn up into the exhaust system despite any open doors. The exhaust system leads to baghouses, structures containing filters, through which emissions are passed and which accumulate particulate that the filters remove from the effluent stream, before it is discharged into the environment.

[59] As exhaust from the Kettle passes through the filters in the baghouses, particulate matter becomes stuck on the filters. An automatic system vibrates the baghouse filters every few minutes to shake entrapped particulate down into a hopper that feeds into a barrel. Periodically, filters must be removed and cleaned as they become too plugged up with the particulate that has been removed from the exhaust to be effective. After the emissions pass through the filters in the baghouses, they discharge into the environment, out of ES01.

[60] To clean these filters, they are submerged in the Caustic Tank, the Rinse Tank, the Flux Tank, and then the Rinse Tank again. The filters are also inspected for any damage. Filters are replaced when they are damaged or if the porosity of the filter gets too low (which happens over time despite this cleaning). Under the Permit, filters must be pre-treated with an approved powder (discussed more in greater detail below) to improve efficiency before they are installed or re-installed in baghouses.

[61] Depending on the baghouse, filters need to be removed and cleaned, on average, anywhere from every 2.5 weeks to twelve months. The baghouses have leak detectors which inform when the filters may be getting plugged or if there is a possible leak, including a tear in the filter.

ES02

[62] ES02 is a set of eight roof vents above the Pre-Treatment Area. These vents contain fans and expel ambient air from the Facility into the environment.

[63] The tanks in the Pre-Treatment Area emit considerable water vapour mixed with mist from the Pickling Tanks, which bears some amount of contaminant(s). ES02 is above various tanks in the Pre-Treatment Area to vent that water vapour and mist, as well as the associated contaminant(s).

[64] Six of the eight vents of ES02 have fans running constantly to draw water vapour from the Facility and discharge it into the environment, although which six are running at any point can be varied at Ebco's discretion. The only contaminant authorized to be discharged from ES02 is sulphuric acid.

[65] Pictures were produced as evidence in the hearing showing brown staining on the north wall of the Facility, on the ceiling above the Pre-Treatment Area, and on the fans within ES02. These pictures were addressed by Ebco's lay witness in this proceeding, Edwin Eppich ("Mr. E. Eppich"). Mr. E. Eppich served as Ebco's Chief Operations Officer at all material times to this appeal, up to 2023, and as Chief Executive Officer from 2023 onward.

[66] Mr. E. Eppich described the staining on the north wall as resulting from the presence of iron, and especially iron sulphate, in the mists generated by the Pickling Tanks. He stated that staining in and around the fans of ES02 and the ceiling of the Pre-Treatment area could stem from the same source, from rusting of the fans and their housings, from welding residue, or some combination of those sources. When asked about brown staining on the exterior roof of the Facility, Mr. E. Eppich considered it most likely to be from iron sulphate.

[67] When asked about staining on the floor of the Facility and near a building entrance leading into the Pre-Treatment Area, Mr. E. Eppich considered them likely to result from forklift wheels picking up fragments of iron from where ungalvanized steel is stored, both inside and outside the building.

Other Emissions

[68] The Facility also contributes emissions to the environment from the exhaust associated with its heater and boiler. These emissions are discharged from a stack near ES01. This emissions source is not at issue in this appeal because it is not governed by the Permit. It is governed instead by an air emissions bylaw passed by Metro. Nonetheless, the emissions from this source constitute part of the background environment into which the Permit-regulated emissions are discharged. They are considered in that context only in these appeals.

Galvanizing Processes Elsewhere

[69] In the hearing, there were two galvanizing operations holding air emissions permits issued by Metro that were discussed: the Facility and another facility (the "Silver City Facility"), operated by Silver City Galvanizing Inc ("Silver City").

[70] One key difference between the Facility and the Silver City Facility is that the Silver City Facility uses hydrochloric acid, not sulphuric acid, for Pickling. Hydrochloric acid pickles steel more quickly. Due to its lower boiling point, hydrochloric acid also fumes when in an aqueous solution, at the temperatures and pressures relevant to these

appeals. Accordingly, the Silver City Facility requires different emissions control processes and infrastructure to achieve the same level of environmental impact, when compared with the Facility.

[71] Ebco also reports that it maintains its Pickling Tanks at a lower temperature than is standard in galvanizing facilities. According to Ebco, this slows the chemical reactions in the Pickling Tanks, resulting in a more gradual formation of hydrogen gas, less misting, and lower levels of emissions.

Business Practices at the Facility

[72] The Facility houses a batch galvanizing operation: it does not consistently galvanize the same materials or the same weights or volumes of product. Rather, the quantity and quality of material to be galvanized depends on orders placed by customers. This means that, even where the same weight of materials may be dipped on different days, the surface area being dipped—and so the amount of Flux being used and the amount of Alloy being added to the steel—varies.

[73] Ebco tracks Galvanizing by the weight of the pre-Galvanized steel. Galvanizing in normal dips typically coats steel in a layer equal to approximately 8% of the weight of the pre-dipped steel. The amount of zinc can vary based on the shape of the steel being Galvanized, as the ratio between the weight and the surface area (and thus the amount of zinc applied) varies by shape. Furthermore, Galvanizing can be done to different thicknesses of Alloy, so the amount of zinc can vary based on the desired thickness of Alloy. Despite these variations, Ebco charges customers based on the weight of the steel to be Galvanized and not those other factors. Customers therefore do not necessarily get a set quantity of Alloy per dollar spent.

History of the Facility, its Approval, and its Permit

[74] Before opening the Facility, Ebco operated a galvanizing facility in Richmond, British Columbia (the "Richmond Facility") for roughly 30 years. The Richmond Facility, which had previously been a foundry, operated under a previous air emissions permit issued by Metro. In 2016, Ebco decided to transfer its galvanizing operations because the weight of the kettle enclosure at the Richmond Facility was causing its foundation to sink into the ground. Ebco decided to build the Facility to house its galvanizing operations.

[75] Initially, Ebco thought they could continue operating under an air emissions permit that would be similar to the one in place for the Richmond Facility. Ebco applied for a permit in respect of the Facility but was advised Metro wanted Ebco to obtain air dispersion modelling prior to a permit being issued.

[76] Metro takes a progressive approach to the regulation of air contaminants, whereby more stringent requirements are imposed as time goes on, both as air emissions permits

expire and must be renewed, and as operations open or change locations. This is a strategy Metro uses to improve air quality and to seek to meet ambient air quality objectives.

Zoning Approvals

[77] In 2014 and 2015, Ebco was preparing to build the Facility and move its operations there. A city councillor, Mike Starchuk, heard about the Facility and invited Ebco to speak at a meeting of the City of Surrey's Environmental Sustainability Advisory Committee ("ESAC"), which Mr. Starchuk chaired. Ebco agreed to attend a meeting on April 22, 2015 (the "ESCA Meeting"). From Ebco, then-Chief Executive Officer Hugo Eppich ("Mr. H. Eppich") attended. The then-Chief Operations Officer, Mr. E. Eppich accompanied him.

[78] According to meeting minutes, Mr. H. Eppich told the committee that testing at the Richmond facility indicated "not even one drop" of zinc smoke was produced. Mr. Starchuk testified in the hearing of these appeals that Mr. H. Eppich also described smoke emissions, similar to when a match is struck, coming from the Facility. Mr. Starchuk testified that he found Mr. H. Eppich less than fully forthright during the ESAC Meeting, as his descriptions of the expected Facility emissions (or lack thereof) were inconsistent and Mr. H. Eppich had not provided relevant background documents to the ESAC Meeting participants.

[79] According to Mr. E. Eppich, some of the minutes from the ESAC Meeting do not accurately reflect what Mr. H. Eppich said. Mr. E. Eppich agreed during cross-examination, however, that the Facility does not just release steam and Ebco knew, at the time of the ESAC Meeting, that they would need an air emissions permit from Metro in order to operate. Mr. E. Eppich believed Mr. H. Eppich was referring to emissions rising to the level of air contaminants when speaking at the ESAC Meeting; however, Mr. E. Eppich recalled that Mr. H. Eppich was being asked overlapping questions and did not think they were suitably asked.

[80] The ESAC recommended to the City Council that the Facility be required to have continuous monitoring and a spill containment plan before any permit was to be issued by Metro. The ESAC asked Surrey's Mayor and Council to request that Metro request Ebco to continuously monitor the Facility. Mr. Starchuk confirmed that staff sent the letters containing those recommendations and the ESAC's request to the Mayor (then Linda Hepner) and Council but was unsure of any reply.

[81] Although Mr. Starchuk had concerns about the information provided by Mr. H. Eppich, Surrey's City Council had already issued all relevant permits for the construction of the Facility.

[82] According to an email from Mayor Hepner to Surrey resident Les Kowalski, sent on January 6, 2016, the Mayor's office understands "… that the facility would be equipped with an appropriate 'scrubber system' to address emissions." The email quotes from a

statement attributed to Ebco, that "steam is the only emission" expected from the Facility, which Ebco had reportedly stated "… should be state of the art."

2016 Air Emissions Approval

[83] After Metro informed Ebco that air dispersion modelling would be required for any permit of the Facility, Ebco applied for a temporary air emissions approval, which would allow the Facility to operate while conducting testing that would inform the air dispersion modelling.

[84] As part of the air emissions approval process, Francis Yuen, an engineer with Metro, performed a technical review in respect of the proposed approval. According to an email he wrote on December 18, 2015, a baghouse was not considered the best available control technology ("BACT") for a "galvanizing dip tank." In a follow-up email on December 21, 2015, Mr. Yuen added that a sulphuric acid "flume" was expected from the Pickling Tanks (expected to contain two to three percent sulphuric acid by volume). He stated, "… wet scrubbers and mist suppressants are considered the [BACT] for capturing acidic gas emissions."

[85] On March 1, 2016, the District Director issued an approval under section 12 of the Bylaw: GVU 1079 (the "Approval"). The Approval authorized Ebco to release contaminants into the air from the Facility until November 30, 2016—a period of nine months. These contaminants were authorized to be emitted from ES01 (which, at the time, was comprised of two baghouses, ES01A and ES01B) and ES02. The Approval required Ebco to conduct stack testing, air dispersion modelling, a human health and environmental impact assessment, and a professional estimate of projected sulphuric acid emissions.

[86] Dr. Katherine Preston, who was the Deputy District Director for Metro at the time of the Approval, testified that Metro required stack testing to understand the full profile of possible air contaminants that were being emitted from ES01 and to allow sulphuric acid emissions from ES02 to be expressed as a flowrate, to facilitate compliance assessment and enforcement as needed. The Richmond Facility emissions had been authorized as a yearly tonnage which was more difficult for Metro to assess and enforce.

[87] These improvements were typical of Metro's strategy to improve air quality: Metro seeks to impose more stringent permit requirements where new permits are issued, either because facilities open, relocate, or face expiring permits. Metro prioritizes permitting on the largest-scale and most contaminating emitters. Furthermore, Metro engages in progressive compliance enforcement with respect to air emissions, from tickets to notices of bylaw violations and, in the most egregious cases, prosecution. These strategies continually improve emissions standards in Metro, which progressively improve air quality within the region.

[88] The Approval was issued following the District Director's review of a recommendation package from Metro staff. Part of this package was a report by Metro permitting specialist, Natasha Silva, who wrote that a scrubber and Anti-Vapour were

considered the BACT for "sulphuric acid flume." Ms. Silva's report noted that Mr. Yuen had also indicated that a baghouse was not considered BACT, but rather "wet scrubbers and mist suppressors" were considered BACT. Ms. Silva had also recommended "environmental assessment regarding contaminant deposition and bioaccumulation and long-term effects" as a reporting requirement for the Approval, in response to concerns expressed by the public during prior public engagement.

[89] The Approval required Ebco to submit plans and reports to the District Director on a specified timetable. Included in those plans and reports were:

- a plan for the air dispersion model (the "Modelling Plan");
- a report describing the methodologies used to estimate emissions, providing the conclusions of the air dispersion modelling, and discussing the impacts the modelled contaminant concentrations would have on human health and the environment (the "Dispersion Model Report"); and
- a report assessing the deposition from the maximum predicted air contaminant concentrations, under both wet and dry conditions, as well as a discussion of any adverse impacts that deposition and accumulation of contaminants may have on human health, aquifers and groundwater, soil quality and agricultural productivity, plants, food crops (including those certified as organic), farm animal health, fish habitat, and fish health (the "Impact Assessment").

[90] Dr. Preston testified that it is not usual for Metro to require a dispersion model report. She indicated that air dispersion modelling is done in other jurisdictions, including Alberta, Ontario, and several states in the United States. Metro typically does not require air dispersion modelling for air emissions permits with annual fees of less than $1,000 because Metro considers them minor emitters which typically do not pose any environmental or human health concern. Where there are public complaints or nearby sensitive receptors, however, Metro may require air dispersion modelling even if permit fees are to be under $1,000. This was the case for the Facility even though Metro expected permit fees for the Facility to be under the $1,000 threshold.

[91] Dr. Preston stated that monitoring gives specific information about a location at a certain time and air dispersion modelling allows the prediction of future circumstances over time and over a large area. Dr. Preston stated that monitoring is useful to "ground truth" air dispersion modelling exercises and the two in concert are "particularly powerful" when assessing environmental impacts associated with air emissions.

[92] Dr. Preston added that it was unusual for Metro to require a potential emitter like Ebco to require an Impact Assessment. Mr. Robb imposed one in this case because of public comments about the Facility, not out of a concern for the Facility's anticipated emissions.

[93] The District Director did not include any requirement for a wet scrubber in the Approval.

[94] Fourteen appeals were started against the Approval. Many of these appellants were the same as the appellants in the present appeal. The appellants in that case applied to the Board for a stay of the Approval. On May 26, 2016, the Board granted that request, in part, only allowing Ebco to discharge air contaminants from the Facility for the purposes of allowing the measurement of emitted air contaminants, necessary to complete the Modelling Plan, Dispersion Model, and Impact Assessment.[4]

[95] Ebco's galvanizing operations returned to the Richmond Facility. During this time, Ebco retained a gardener to maintain the Site. There was a miscommunication in work instructions and the gardener removed the surface of the Bioswale and replaced it with topsoil. Ebco contracted with the engineering firm that had constructed the Bioswale to have it restored, but it was not restored with the ground level reestablished to the height of the lawn drains until roughly July 2022.

2016 Stack Testing

[96] While the Approval was stayed, the Facility ceased operations other than for the purpose of conducting air emissions testing (a "Stack Test"). The Stack Test was conducted by A. Lanfranco and Associates Inc. ("Lanfranco"). This Stack Test was performed from June 13 to 15, 2016. Lanfranco reported that it used methods approved for Stack Testing by Metro, British Columbia's Ministry of the Environment (as it then was), Environment Canada, and the United States Environmental Protection Agency.

[97] At the time, the roof vents of ES02 had rain deflectors installed above them. These were not authorized by the Approval and were removed sometime subsequently, when Ebco realized they were not authorized.

[98] Stack Testing was supervised by Metro staff. One staff member was inside the Facility to confirm that "normal activities" were being performed. Another was on the roof of the Facility with Lanfranco staff, ensuring that the Stack Testing procedures followed established protocols.

[99] Because the Facility did not have "normal" operations on which to base production during the Stack Test, Ebco used instead the average hourly production weight from their previous two to three years of operations at the Richmond Facility. In the circumstances, Metro approved this production volume for the purposes of the 2016 Stack Test.

[100] Nine Galvanizing dips were conducted during Stack Testing of ES01 over two of the three test days: June 14, 2016, and June 15, 2016. Stack Testing involved three sampling events for each of ES01A (done on June 14, 2016) and ES01B (done on June 15, 2016).

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[4] See *Nickomekl Enhancement Society v. Patricia Rush*, 2016 BCEAB 8 (CanLII).

Testing events lasted from 1 hour, 13 minutes to 1 hour, 23 minutes. The total time of measurement was 3 hours, 46 minutes for ES01A and 3 hours, 59 minutes for ES01B.

[101] The post-Galvanized weights for the dips ranged from 1,468 to 1,617 pounds (averaging roughly 1,534 pounds and totaling 13,805 pounds over the shift) on June 14, 2016, and from 1,428 to 1,640 pounds (averaging roughly 1,567 pounds and totaling 14,100 pounds) on June 15, 2016. The overall per-shift weight of material that was Galvanized was 13,951 pounds. According to the notes of the galvanizer those days, the material Galvanized consisted of poles, frames, a trailer, and round plates.

[102] The 2016 Stack Test report does not document what activities, if any, were being done in the Pre-Treatment Area when Lanfranco measured the sulphuric acid emissions from ES02: from 10:33 to 11:48 a.m., from 12:12 to 1:25 p.m., and from 1:54 to 3:05 p.m., all on June 13, 2016.

[103] Ebco provided production documents to the Board, however, outlining that on June 13 and 14, 2016, a total eleven loads of steel were pickled. While the documentary evidence it unclear, if the entries start on June 13, 2016 and are sequential without entries from June 14, 2016 interspersed, Pickling began on June 13, 2016, at 10:30 a.m. Over the span of the first test (10:33 to 11:46 a.m.), three loads totalling 4,350 pounds were pickled for a total of 61 minutes. During the second test (12:12 to 1:25 p.m.), three loads (two of which had weights of 1,440 pounds associated and the third of which had no weight associated) for a total of 62 minutes. During the third test (1:54 to 3:05 p.m.), two loads with a total weight of 2,838 pounds were pickled for a total of 50 minutes.

[104] The stack testing measured for a range of potential contaminants coming out of ES01A and ES01B. At the time, ES01C did not exist. The 2016 stack test results revealed, with respect to ES01:[5]

[5] Not all measured parameters are shown. Only those relevant to the arguments raised in these appeals are included. In some instances, results are rounded to four significant digits.

	ES01A				ES01B			
Parameter (mg/m^3)	**Test 1**	**Test 2**	**Test 3**	**Average**	**Test 1**	**Test 2**	**Test 3**	**Average**
Particulate	0.44	0.63	0.73	0.60	0.18	0.24	0.51	0.31
Ammonia	1.815	1.525	1.927	1.756	1.551	0.704	2.105	1.453
Ammonium Chloride	0.097	0.081	0.098	0.092	0.048	0.002	0.002	0.017
Chlorine	0.039	0.032	0.040	0.037	0.046	0.061	0.045	0.050
Hydrogen Chloride	0.091	0.103	0.085	0.093	0.050	0.061	0.066	0.059
Nickel	0.0003	0.0003	0.0002	0.0003	0.0001	0.0001	0.0001	0.0001
Lead	0.0007	0.0004	0.0005	0.0005	0.0004	0.0003	0.0002	0.0003
Zinc	0.1796	0.2077	0.2282	0.2052	0.0571	0.0255	0.0162	0.0329

[105] As noted above, each testing event involves averaging three separate tests. The tests each ran for roughly one hour, plus time to set up and, where necessary, take down. Each testing event is therefore of a different Galvanizing dip, so results would not be expected to be identical.

[106] Lanfranco also constructed a wood structure on one roof vent within ES02, above one or more of the Pickling Tanks, to capture emissions from that roof vent. The Stack Test results showed, with respect to ES02, sulphuric acid concentrations of 0.0184, 0.0203, and 0.0190 mg/m^3 over three tests, for an average of 0.0193 mg/m^3. The Stack Test did not measure for any other potential air contaminants from ES02.

[107] When reporting results that were below the method detection limits laboratory analyses, Lanfranco reported the laboratory detection limit, representing a conservative overestimate of certain parameters. Of those listed above, only nickel results for ES01B were the subject of this conservative overestimation.

2016 Permit Application

[108] On January 3, 2017, Ebco applied to the District Director for an air emissions permit. The application was to emit zinc, particulate, sulfuric acid, ammonia, ammonium chloride, chlorine, and nickel as possible air contaminants into the environment. Lead and hydrogen chloride were not listed as potential contaminants to be regulated under the Permit, nor were any potential contaminants to be released from ES02, other than sulphuric acid.

[109] When Metro receives an application for an air emissions permit, staff conducts a completeness check to ensure all necessary documentation has been provided (the forms are filled in, a business licence is attached, etc.) and a technical completeness review. This review is completed by an engineer, who ensures that the process description and flow diagrams are complete and illustrative of the relevant process(es), the sources of air contaminants have been included, and the requested tonnages seem to be in keeping with what is expected based on the information provided.

[110] Metro may make comments on the application and tracks those comments and responses from the applicant using a tracking table. The completeness review may require several, iterative submissions by the applicant. In this case, Ebco signed a declaration associated with the application on January 3, 2017, after this process was complete. The declaration contained the emissions limits Ebco was seeking to have approved, which were lower than what had been authorized under the Approval.

[111] At this point, Metro calculated the fees associated with the emissions sought to be authorized under Ebco's permit application. The fees are calculated based on the tonnage of contaminants to be released, multiplied by a risk-based dollar value associated with each contaminant. Ebco's annual fee was calculated at $230. Metro collects $2,000,000 in fees annually in air emissions permit fees, with the top three emitters paying $400,000 to $500,000 in aggregate. These fees are paid based on allowable permit levels of emissions, not the actual emissions, which should be lesser in each case.

Notification and Stakeholder Engagement

[112] After an application for an air emissions permit is considered complete, Metro may notify the public, for example if it is required to do so under the *Environmental Management Act Public Notification Regulation*, B.C. Reg. 202/94 (the "Notification Regulation").

[113] Ebco's permit application required public notice under the Notification Regulation. To affect notification, Metro required that an Environmental Protection Notice (the "Notice") was posted at the Site, published in the BC Gazette and local newspapers, and sent electronically to anyone who had complained about the Facility in the prior three years, in addition to other requirements listed in the Notification Regulation. This notification took place in March 2017 and April 2017 in this case.

[114] A public engagement session was held on April 18, 2017, at East Kensington Elementary School in Surrey, British Columbia. In this session, Mr. Robb and representatives from Ebco addressed the public and responded to questions and comments.

[115] The Notice was also sent to local municipalities (the Township of Langley, the City of Langley, and the City of Surrey). The Notice was also sent to several government agencies: Environment and Climate Change Canada, the Fraser Health Authority, and the BC Ministry of Agriculture. With the exception of the notification sent to Environment and

Climate Change Canada, which occurred in March 2017, notifications were sent to municipalities and agencies in October 2017.

[116] Of the municipalities contacted, one councillor from the Township of Langley responded, requesting continuous monitoring of Ebco's emissions.

[117] Metro referred public concerns expressed in and after the public information session to the Ministry of Agriculture. In response to those concerns, Dr. Dieter Geesing from the Ministry of Agriculture recommended a long-term soil, plant tissue, and water monitoring program, which was later included as a requirement of the Permit.

[118] All comments received were recorded by Metro, and Ebco had an opportunity to respond to the public comments, as did Metro's staff. All this information was included in the material ultimately referred to the District Director for their decision.

Technical Review of the 2016 Permit Application

[119] Metro also completes a technical review in respect of any proposed air emissions permit it receives. The technical review includes verification that the proposed permit addresses all potential contaminants given the described industrial process(es), an analysis of what further studies should be required before or after a permit is issued, and a BACT assessment for the proposed permit. In this case, a senior project engineer with Metro, Mr. Kemp, completed the technical review on October 31, 2017.

[120] Mr. Kemp's review started with an assessment of the theoretical emissions from the Facility, including whether the emissions would be liquids or gases. He considered the emissions control technology proposed by Ebco, its efficiency, and Ebco's rationale for its selection. He used his professional expertise as an engineer familiar with emissions treatment to assess whether the proposed emissions to be regulated by a permit were complete and that the proposed emissions treatment system was appropriate.

[121] Mr. Kemp's review also relied upon his review of BACT guidelines. He stated various definitions of BACT exist, but he defined it as the best technology to achieve a limit on emissions that is practical and commercially available.

[122] As Metro does not issue its own BACT guidelines, Mr. Kemp reviewed the guidelines of other jurisdictions. He typically considers standards in Massachusetts, Texas, California, the European Union, and the United Kingdom because those jurisdictions (and Massachusetts and Texas in particular) tend to have the most substantial regulations and most comprehensive sets of BACT information. In this case, he also looked for standards from British Columbia, Alberta, Ontario, Australia, and New Zealand. When assessing BACT, he bases his analysis on his professional knowledge of emissions control technology.

[123] Mr. Kemp noted that the BACT guidelines he relied on chiefly were from Texas and were written in 2013. He testified that, when he referred to those standards, they were about five years old and it was not unusual to refer to BACT guidelines of roughly that age. He conceded during cross-examination, however, that it was theoretically possible for

BACT to have changed between the date the guidelines were published and when he consulted them.

[124] With respect to ES01, Mr. Kemp recognized the baghouses in this case were produced by a familiar, reputable manufacturer and considered Ebco's rationale about baghouse use to be appropriate. According to BACT publications he reviewed, baghouses were standard control technology in galvanizing and other metalworking facilities. Texas listed baghouses with a control efficiency of 99.5% at 0.5 microns as BACT for galvanizing operations and did not require a scrubber as well.

[125] With respect to ES02, Mr. Kemp did not recommend a scrubber because he did not think one was needed. Mr. Kemp noted that Anti-Vapour was considered BACT. In Texas, a 90% reduction of hydrochloric acid emissions without a scrubber was considered BACT. The Texas guidelines, and BACT guidelines generally, do not differentiate between fuming and misting. Mr. Kemp considered the use of suphuric acid instead of hydrochloric acid, plus the use of Anti-Vapour, to be sufficient to reach this threshold. Mr. Kemp noted that where BACT guidelines recommended scrubbers to treat acid emissions, those emissions pertained to hydrochloric acid and not sulphuric acid.

[126] Mr. Kemp also reviewed air emissions permits for two galvanizing facilities in New Zealand to see what standards had been achieved there. He stated the authorized emissions in those cases were roughly equal to or greater than the level of emissions requested by Ebco in this case.

[127] Mr. Kemp's BACT review did not consider any fugitive emissions because they were not included as part of the proposed permit. Had he known that the south end of the Facility was open, he would have had additional questions for Ebco on the containment of potential emissions. Even if he knew there was, or would be, powerful fans blowing air in from the south end, he stated he would have had additional questions.

[128] A BACT review also assumes the maintenance and usage procedures for emissions control technology will be followed. Mr. Kemp considered it the role of compliance assessment and enforcement to ensure and require that these procedures are followed with respect to any given air emissions permit.

[129] At the end of his technical review, Mr. Kemp drafted a memo to Mr. Robb, stating that the technical information submitted in the permit application was complete and that the proposed emissions control technology satisfied Metro's BACT requirements. He did not make any recommendation for a continuous monitoring system being requested or considered for the Facility and, in the hearing, did not recall any discussions about including such a recommendation for consideration of the District Director.

2017 Dispersion Model Report and Impact Assessment

[130] As discussed above, Ebco had to submit a Modelling Plan to Mr. Robb for approval. This Modelling Plan was ultimately approved by Mr. Robb, but on the recommendation of Dr. Preston and one other Metro staffer, a climatologist. Dr. Preston stated that her

recommendation followed three rounds of discussions over several months with Ebco and the consultant Ebco retained to conduct the air dispersion modelling: Mark Milner from Hemmera Inc. ("Hemmera"). During those months, Dr. Preston provided feedback and recommendations on the methodology Hemmera was to use in the air dispersion modelling exercise.

[131] Dr. Preston stated that she also reviewed two draft versions of Hemmera's air dispersion modelling report. Dr. Preston spent several months making 43 critiques and recommendations as to those draft reports, before Hemmera produced a finalized version of the report on September 22, 2017 (the "2017 Hemerra Report"). The 2017 Hemerra Report was signed off by Mr. Milner.

[132] The 2017 Hemmera Report contained both the Dispersion Model Report and Impacts Assessment. The air dispersion model was designed and executed in accordance with the Modelling Plan. The air dispersion model was also run in accordance with the BC Ministry of the Environment's British Columbia Air Quality Dispersion Modelling Guideline.

[133] Hemmera's air dispersion modelling in this case was done on computers using several different programs that operate together. Topographical information is inputted into the system and a meteorological model called CALMET is used to predict the weather of the study area. CALMET relies on inputs that were entered based on historical meteorological data from the Greater Vancouver Area and, in particular, on data from the three meteorological stations closest to the Site.

[134] CALMET models wind speed and wind direction as well as other meteorological phenomenon, including precipitation, humidity, and fog, to simulate one year's worth of meteorological effects. Hemmera ran CALMET over a 21-kilometre square study area. This study area featured a horizontal grid with lines spaced every 250 meters. At each intersection in that grid space, CALMET predicted hourly weather data for a year, at several different vertical strata.

[135] Alongside CALMET, a second modelling program was used: CALPUFF. CALPUFF was run over a 20-kilometre square subset of CALMET's study area. Simulated puffs of contaminants with specified parameters (concentration, temperature, velocity, etc.) were introduced into the model every hour over the year for which weather was being simulated by CALMET. These puffs were consistent for each hour of the simulation, and CALPUFF tracked how these puffs migrated, dispersed, and interacted over the course of the simulated year, given the meteorological predictions made by CALMET, including effects due to interactions between emissions and variable humidity levels, up to and including foggy conditions.

[136] CALPUFF allows coefficients to be set for each grid square, providing it a roughness value, which approximates the degree of turbulence generated by variations in topography and features at that point in space. This accounts for the fact that greater turbulence and mixing occur where there are trees, for example, as opposed to farmland. Such turbulence also tends to bring any air emissions present down closer to the ground.

[137] CALPUFF is unable to account for several large-scale phenomena in modelling the behaviour of air contaminants:

- effects of land use on meteorology, such as heat effects from roadways;
- removal of emissions from the air by contact with wet surfaces; and
- emissions with natural buoyancy greater or lesser than the ambient air at the same temperature.

[138] CALPUFF can account for microclimates within a cell, but this requires inputs that will trigger these effects.

[139] In the 2017 Hemmera Report, CALPUFF calculated the concentration of the simulated air contaminants from ES01, ES02, and the Facility's boiler stack within the designated study area. These calculations ran in the context of CALMET's weather data, and terrain features. CALPUFF was configured to produce results in this case, with grid spacing of:

- 20 meters along the Site boundary
- 50 meters within a 500-meter range of the point of emission (the Facility),
- 250 meters within a 2-kilometre range of the point of emission,
- 500 meters within a 5-kilometer range of the point of emission, and
- 1,000 meters within the remainder of the study area.

[140] Other points of calculation were calibrated and defined as "sensitive receptors" within the study area. These represented residences, businesses, a school, and a waterway (Erickson Creek) to allow for the calculation of predicted concentrations of potential contaminants at those points of particular interest.

[141] While a "sensitive receptor" typically denotes one or more human receptors and not an area of natural interest (such as an aquifer or a stream), Erickson Creek was designated as a sensitive receptor in this case. At each of these "sensitive receptors," CALPUFF modeled the concentration of each potential air contaminant, at several elevations, once per hour over the simulated year.

[142] CALPUFF is unable to predict smaller scale effects buildings have on the dispersion of potential air contaminants from the Facility (building downwash). This occurs when winds pass across a building and slow because of increased turbulence on the leeward side of the building. The air slows and is drawn down nearer to the ground close to a building when building downwash occurs. Where air contaminants are present, this increases the concentration of those contaminants in the immediate area. Where there are multiple emissions sources present, this may lead to mixing of the contaminant plumes.

[143] Another program provides this aspect of air dispersion modelling: the Building Program Input Program ("BPIP"). BPIP was used in this case.

[144] The air dispersion model in this case was used to calculate the dispersion of potential air contaminants emitted from the Facility based on typical substances of interest from a hot dip galvanizing facility and based on the results of the 2016 Stack Test: particulate matter less than 2.5 microns in diameter ("PM2.5"), zinc, nickel, sulfuric acid, chlorine, ammonia, and ammonium chloride.

[145] The reports described air dispersion and contaminant deposition based on two input scenarios:

- normal operating conditions, continuously throughout the year, based on the expected emissions from the Facility as demonstrated in the 2016 Stack Test; and
- maximum permit conditions, which assume the Facility emitting the maximum amount of contaminants allowable under the Permit, continuously throughout the year.

[146] In each case, air contaminant concentrations calculated by CALPUFF and BPIP were added to background concentrations for those contaminants that were generally defined as the 98th percentile from Metro's nearest air quality monitoring stations over the preceding year. The exceptions to that are values for chlorine and ammonium chloride, both of which were assumed to be at trace amounts under the approved air dispersion modelling plan, as no monitoring data was available for those compounds. By adding the background concentrations with the calculated contributions from the Facility, the air dispersion analysis provided an overall predicted concentration for each potential air contaminant studied, at each grid spacing and for each "sensitive receptor" in the study area and over every hour of the simulated year.

[147] The Dispersion Modelling Report then provided the maximum predicted total concentration for each potential air contaminant, under both "normal operations" and permit conditions. The report provided plots delineating the distribution of these maximum concentrations for each potential air contaminant. A map of these predicted maximums for each potential air contaminant was depicted using lines of constant concentration as isopleths.

[148] The Dispersion Modelling Report then compared the maximum predicted concentrations for each potential air contaminant, anywhere in the study area for any hour in the simulated year, against relevant ambient air quality objectives. Metro's Ambient Air Quality Objectives ("AAQOs") were used where available. If the AAQOs were silent on any potential air contaminant, the maximum concentration predicted was compared against the most stringent objective from Ontario, Alberta, and Texas. Those jurisdictions were considered to have the largest list of potential air contaminants in their ambient air quality objectives, and the most stringent standards.

[149] This Dispersion Modelling Report made this comparison to assess whether there are any expected human health or environmental impacts associated with the potential air

contaminants predicted to be emitted from the Facility. This is because the AAQOs provide concentrations for various air contaminants (depending on the jurisdiction that has issued the AAQOs), above which human health and/or environmental impacts are considered possible to occur. According to the Dispersion Modelling Report, none of the ambient air quality objectives were exceeded for either permit conditions or normal operating conditions.

[150] The Dispersion Modelling Report provided the following air dispersal information with respect to the substances it evaluated:

Substance	**Averaging Period**	**Background (mg/m^3)**	**Facility Contributions (mg/m^3)**	**Total (mg/m^3)**	**Air Quality Objective (mg/m^3)**
PM2.5	24-hour	0.0165	0.00714	0.02364	0.025
Ammonia	1-hour	0.0468	0.0218	0.0686	0.18
Ammonium Chloride	24-hour	n/a	0.00038	0.00038	0.12
Chlorine	1-hour	n/a	0.00336	0.00336	0.015
Sulphuric Acid	1-hour	0.00421	0.00285	0.00706	0.01
Nickel	1-hour	0.000013	0.00003	0.000043	0.00033
Zinc	1-hour	0.000048	0.01673	0.01678	0.02

[151] The Impacts Assessment provided calculations of 30-day deposition rates at all grid spacings in the CALPUFF study area, plus sensitive receptors. The Impacts Assessment assumed that deposited material would accumulate year over year in the top 10 centimetres of soil. Using the highest simulated deposition rates anywhere in the study area at any time, the report concluded that a measurable (10%) increase in zinc above background levels would take 23 years. Such an increase in nickel would take 9,332 years. For a measurable increase in zinc above background levels at any sensitive receptor would take anywhere from 77 to 3,337 years. Such an increase in nickel would take tens of thousands or millions of years, according to the Impacts Assessment.

[152] Based on the amount of time projected for any measurable increase in nickel or zinc in the study area, the Impacts Assessment concluded that adverse impacts to vegetation, soil, surface water, and groundwater from nickel and zinc emissions were considered negligible.

Comment from Fraser Health

[153] Metro sent the 2017 Hemmera Report along with the Notice to Fraser Health and asked for any additional comments. Fraser Health had no recommendations other than for an odour management plan, which ultimately developed into a complaint management plan later included as a requirement of the Permit.

Recommendation Memo

[154] Once Metro completed the technical review and review of the 2017 Hemmera Report, Metro staff and Ebco staff engaged in an iterative process to draft a permit. This is typical of Metro's approach, where the applicant for a permit assists in drafting the permit that is ultimately submitted to the District Director for consideration. Once again, questions, comments, and responses were tracked on a tracking sheet. Once Metro staff were satisfied as to the contents of the draft permit, it was sent to Mr. Robb, along with a recommendation memo that addressed recommended permit requirements, including the term of the permit. The recommendation memo appended various documents, including the permit application, a summary of the staff's administrative and technical reviews on the application, summary of comments from the public and stakeholders as well as Metro staff's responses. The recommendation memo in this case was provided to Mr. Robb on March 26, 2018.

[155] After receiving the recommendation memo, the District Director decided whether to issue a permit, and if so, the associated conditions and requirements that would be imposed. Generally, and in this case in particular, when considering issuing a permit authorizing the release of air contaminants, he considers whether:

- the permitting process was fair and complied with the law,
- the permit is in the broad public interest when weighing competing interests involved in its approval or refusal,
- there is an adequate and practical prevention of emissions, through production processes, collection efficiency, treatment, and dispersal, and
- the permit would reflect an aim of improving air quality over time.

[156] In assessing these criteria, Mr. Robb considered the recommendation memo and its attachments, the rationale for the proposed permit, and the test prescribed by the legislation: whether the conditions for the proposed permit are advisable for the protection of the environment. He considers the fee associated with the proposed permit as a broad view of the potential risks associated with the emissions, how close members of the public are to the source of emissions, the specific process(es) and emissions involved (both type and quantity), and the terms of the recommended permit.

[157] Mr. Robb testified that, if he had wished to include anything in the Permit Ebco had not seen previously, he would have given Ebco an opportunity to comment. After issuing

the Permit on March 28, 2018, Mr. Robb notified all those who had commented on Ebco's application of the Permit's issuance.

[158] Mr. Robb stated that, in making permit decisions, he is guided by the following principles:

- maintenance of air quality that satisfies Metro's ambient air quality objectives;
- not substantially increasing air contaminant concentrations from point sources relative to existing concentrations;
- minimizing the discharge of air contaminants by using commercially-viable BACT; and
- being consistent between permits.

[159] In considering terms of air emissions permits, Mr. Robb considered there to be four types of emissions control: prevention, collection, treatment, and dispersion, and that it was better to prevent emissions than to treat them or disperse them. Mr. Robb stated that, in his experience, there are no zero-emissions facilities and that some element of fugitive emissions is always present.

[160] Mr. Robb decided a scrubber was not necessary to treat emissions from ES02 for three reasons: sulphuric acid did not cause emissions to the same extent as hydrochloric acid, Ebco was preventing emissions with Anti-Vapour that he could require to be used under the Permit, and the interior of the Facility was safe for workers without personal protective equipment and generally the emission of ambient room air in such circumstances does not require treatment, particularly where it will be dispersed into the environment.

[161] Mr. Robb stated the only contaminant of concern for ES02 was sulphuric acid. He thought exposure levels outdoors will be a hundred to a thousand times less than exposure levels within the Facility. He stated that he understood that the contents of the Caustic Tank and Flux Tank would not create air emissions, nor would fumes from the Pickling Tanks.

[162] With respect to continuous emissions concentration monitoring, Mr. Robb stated that such systems have high capital and operating costs, running into the hundreds of thousands of dollars. Such systems are required, for example, of the three largest emitters of air contaminants in Metro, but not for any emitter with such small permit fees as Ebco's Facility. Mr. Robb did not see any opinion by any experts that such a system was indicated due to environmental or human health risks. In fact, Mr. Robb considered there to be many other sources of unpermitted emissions in the area that posed a greater risk, including wood burning and agriculture.

[163] Ultimately, Mr. Robb decided to approve the 2018 Permit as recommended based on his review of the available information. He considered the 2018 Permit to be sufficiently protective of the environment to warrant its approval.

The 2018 Permit

[164] The version of the Permit issued on March 28, 2018 (the "2018 Permit"), authorized the release of contaminants into the air by the Facility until February 28, 2033.

[165] The 2018 Permit authorized ES01A and ES01B to each discharge up to 142 m^3/minute of air, for up to 8,760 hours per year (24 hours per day, 365 days per year). The 2018 Permit defined certain criteria for stack size and configuration, as well as minimum effluent temperature. It set minimum standards for emissions quality, effective July 28, 2018, for ES01A and December 31, 2018, for ES01B. The standards for both defined the following maximum levels of potential air contaminants:

- 6.5 milligrams ("mg") of ammonia per m^3;
- 2 mg of ammonium chloride per m^3;
- 1 mg of chlorine per m^3;
- 0.01 mg of nickel per m^3;
- 5 mg of zinc per m^3;
- 10 mg of particulate matter pre m^3; and
- 5% opacity.

[166] Mr. Robb explained that the opacity limit was present so that Metro staff could, easily and without advanced notice to Ebco, assess the emissions from ES01 during daylight hours from outside the Site. He stated this would be useful as a compliance assessment tool.

[167] As mentioned previously, the baghouse filters were to be pre-treated with substances to enhance their efficiency at capturing particulate. The pre-treatment substances had to be approved in advance by the District Director. At some point (it is not clear when based on the information provided with this appeal), the District Director approved a pre-treatment substance called Perlite. The 2018 Permit also required the installation and use of a leak detector on each of ES01A and ES01B.

[168] The 2018 Permit authorizes a maximum flow rate of 1,825 m^3 per minute from ES02, for 8,760 hours per year. Only six of the eight vents are allowed to operate at any time, and six must be operated at all times. The Permit requires the use of Anti-Vapour, with the amounts added daily to be logged and available for inspection. The Permit defines the height and configuration of the vents, as well as a minimum effluent temperature. The Permit allows concentrations of sulfuric acid up to 0.055 mg per m^3 to be emitted from ES02, a figure that was calculated based on the concentration requested by Ebco, the results of stack testing and air dispersion modelling exercises, compared against applicable AAQOs.

[169] Ebco asked Mr. Robb about whether sulphuric acid at a concentration of 0.055 mg/m^3 even constituted an air contaminant. Mr. Robb stated he did not think it was worth

arguing over this question. He considered a substance to be an air contaminant if it is released into the environment above either the occupational health and safety exposure limit or the applicable ambient air quality objectives. He considered further assessment to be required to determine whether emissions concentrations below the occupational health and safety exposure limit qualified as air contaminants: the exposure limit is designed to be protective of average workers, not the sorts of vulnerable populations considered in setting ambient air quality objectives.

[170] The 2018 Permit required several plans and reports to be submitted to the District Director by Ebco:

- a baghouse report, submitted annually beginning in June 2018;
- a soil, plant tissue, and water sampling plan, to be submitted by July 2018;
- a stack test plan, to be submitted by August 31, 2018;
- a complaint management and communication plan, to be submitted by August 2018;
- soil, plant tissue, and water sampling reports ("SPW Reports"), every six months from October 2018 to April 2020, and then once every two years starting in April 2021;
- a complaint summary report, submitted every year starting in February 2019;
- stack test reports for ES01A and ES01B, each in alternating years from the other, every October;
- originating period reports every year, specifying the number of operating hours and days in the preceding year;
- a BACT assessment plan, to be submitted by November 2029; and
- a BACT assessment report, to be submitted by November 2030.

[171] The Stack Test Reports require testing for more substances than are authorized to be emitted. This was to address emissions that Metro does not consider to rise to the level of air contaminants, such as thallium and lead. This allows Metro to assess, on an ongoing basis, whether any emissions rise to the level of air contaminants, such that limits should be added to the Permit. Metro considers that a substance is an air contaminant where it is present in the environment at concentrations above ambient air quality objectives.

[172] Stack Testing is also required to be based on a level of production as comparable as possible to the average weight of steel Galvanized per shift over a 90-day period preceding the Stack Test.

[173] SPW Reports were required because Dr. Geesing from the Ministry of Agriculture had expressed concerns about public perception around the Facility's emissions given the presence of nearby organic-certified farms. While Mr. Robb did not think the Facility would

be the main source of metal contaminants in the area, Ebco agreed to include the requirement for SPW Reports in the Permit so Mr. Robb included it.

Facility Operations Under the 2018 Permit

Production

[174] Production documents from the Facility's operations in 2019 that were submitted to the Board indicate a range of steel weights that were Galvanized over eight shifts. The information provided indicates the following production details over those shifts:

Date	Shift	Production Weight (pounds)	Time of Galvanizing
January 3, 2019	Day	23,656	10:14 a.m.– 10:44 a.m. 10:48 a.m. – 11:16 a.m. 11:25 a.m. – 11:50 a.m. 12:25 p.m. – 12:54 p.m. 1:00 p.m. – 1:30 p.m.
January 3, 2019	Afternoon	10,400	6:50 p.m. – 7:10 p.m. 8:30 p.m. – 8:50 p.m.
February 11, 2019	Afternoon	23,672	4:55 p.m. – 5:50 p.m. 6:30 p.m. – 6:50 p.m. 7:45 p.m. – 8:10 p.m. 9:10 p.m. – 9:30 p.m.
February 12, 2019	Day	16,898	9:40 a.m. – 10:05 a.m. 10:30 a.m. – 10:55 a.m. 1:40 p.m. – 2:00 p.m.
February 12, 2019	Afternoon	10,624	3:10 p.m. – 3:30 p.m. 4:45 p.m. – 5:05 p.m. 5:10 p.m. – 5:20 p.m. 7:10 p.m. – 7:30 p.m. 9:20 p.m. – 9:45 p.m.
Average Weight (pounds)		17,050	

Stack Testing

[175] As described above, Stack Testing in 2018 was mandated for the Facility under the 2018 Permit. Stack Tests were based on "normal production" over a 90-day period preceding the Stack Test. Ebco calculated the applicable production rate and submitted it to Metro before the scheduled 2018 Stack Test. As was previously done, the Stack Testing was observed by two Metro staff: one on the roof, observing the testing procedure, and one in the Facility, ensuring normal operations were followed.

[176] Ebco's calculation involved dividing the total weight dipped in the 90-day period by the number of shifts worked in the same period. As shifts were eight hours long, the resulting number is then further divided by eight to arrive at an hourly production rate. According to Ebco, this figure was relatively consistent over the life of the Permit. As a safety factor, Ebco tried to add an extra 10% weight to the amount calculated for the purpose of the Stack Testing, where feasible.

[177] According to production records from the dates of the Stack Test (August 22 and 23, 2018), there were three production runs, each comprising three dips, on each day.

[178] ES01B was assessed on August 22, 2018. On that day, the production runs involved: three dips totalling 6,238 pounds; three dips totalling 7,682 pounds; and three dips totalling 13,252 pounds. The total weight Galvanized over that shift was 27,172 pounds. The materials Galvanized included frames, rails, round plates, poles, tubes, angle irons, grating, and joint parts.

[179] ES01A was assessed on August 23, 2018. On that day, the production runs involved: three dips totalling 11,708 pounds; three dips totalling 9,334 pounds; and three totalling 10,494 pounds. The total weight Galvanized on that shift was 31,536 pounds. Materials Galvanized included tubes, plates, poles, frames, grating, and angle iron.

The Stack Test report indicates that the duration of each of the three tests for each of ES01A and ES01B ran for between one hour and two minutes and one hour and six minutes. The 2018 Stack Test indicated the presence of the following substances:

Substance	ES01A (mg/m^3)	ES01B (mg/m^3)
PM2.5	2.6	3.5
Ammonia	3.09	4.75
Ammonium Chloride	0.03	0.01
Cadmium	0.00005	0.00007
Chlorine	0.65	1.00
Hydrogen Chloride	0.87	28.70
Lead	0.00076	0.00086
Nickel	0.00031	0.00075
Zinc	0.18534	0.05321

[180] All emissions were less than the applicable ambient air quality objectives apart from ammonia (which had an AAQO of 0.18 mg/m^3), chlorine (which had an AAQO of 0.015 mg/m^3), and hydrogen chloride (which had an AAQO of 0.075 mg/m^3). Stack Testing under the 2018 Permit was otherwise within the limits set by the 2018 Permit.

[181] Metro's "rule of thumb" when considering potential contaminants measured in stack testing, as described in the hearing by Dr. Preston, is that an emission may be an air contaminant if, at the point of discharge into the environment, it is ten times greater than the applicable ambient air quality objective. This is based on an assumption that dispersion reduces the potential air contaminant by a factor of ten. Metro's position is that, in reality, the dilution factor will lie somewhere between 20 and 30, depending on the circumstances of any given emission.

[182] Using this "rule of thumb", Metro considered the concentrations of ammonia, chlorine, and hydrogen chloride to be sufficiently high that they may have amounted to air contaminants. Despite the cadmium and lead detected in the 2018 Stack Test, Metro did not consider them to be a potential air contaminants because they were less than ten times greater than the applicable AAQOs. Metro remained interested in monitoring lead emissions in subsequent Stack Tests, however.

Offsite Concerns

[183] In December 2018, a pregnant mare at IronGait Farm suffered a miscarriage. Previous health checks of the mare indicated no cause for concern. Before the miscarriage, the mares on IronGait Farm had not suffered any miscarriages and their

breeding program was, by all accounts, successful. Those principally involved at IronGait, Mr. Mueggenberg and Ms. Orringe, related the miscarriage to the Facility's emissions.

[184] In February 2019, a second mare suffered a miscarriage at IronGait Farm. This was the second miscarriage in IronGait Farm's history. Again, Mr. Mueggenberg and Ms. Orringe believed emissions from the Facility to be responsible.

The 2019 Permit

[185] According to Ebco, Metro took longer than expected to approve the soil, plant tissue, and water sampling plan that Ebco submitted by July 2018. Ebco says it was unable to complete the SPW Reports by the schedule contemplated in the 2018 Permit. As a result, Ebco asked Metro that the initial SPW Report be due on April 5, 2019, and for the timing of subsequent reports to be adjusted accordingly.

[186] Metro agreed to this amendment. Metro also advised Ebco that it had inadvertently omitted from the 2018 Permit an annual reporting requirement for Ebco to submit a principal products and principal raw materials report. Ebco consented to include this as another amendment of the 2018 Permit.

[187] Dr. Preston stated that, in the context of the Permit, a principal products and principal raw materials report would allow Metro to track the usage of sulphuric acid and Anti-Vapour at the Facility, to verify the amount of each product used. Dr. Preston described this as a means of assessing Ebco's compliance with the Permit.

[188] On March 26, 2019, the Permit was amended. This version of the Permit (the "2019 Permit") amended the schedule for the submission of SPW Reports and added a requirement for Ebco to submit an annual principal products and principal raw materials report by March 31 each year.

Facility Operations Under the 2019 Permit

SPW Reports

[189] Ebco retained Envirochem Services Inc. ("Envirochem") to complete the SPW Reports required by the Permit. This work was done by Eric Choi, in accordance with the soil, plant tissue, and surface water sampling plan previously approved by Mr. Robb. Mr. Choi completed SPW Reports three times under the 2019 Permit: in April 2019, in October 2019, and in April 2020.

[190] There are four sampling locations addressed in SPW Reports:

- Sampling Location 1a ("SL1A"), which was considered the closest possible location to the area of maximum predicted deposition of nickel and zinc under the 2017 Hemmera Report that allows for sampling of soil and plant tissue;
- Sampling Location 2 ("SL2"), which is the closest location on Erickson Creek to SL1A;

- Sampling Location 5, which is the closest point to SL1A that allows sampling of soil, plant tissue, and surface water; and
- a background sampling location (the "Background Location"), which is 2.4 kilometres from the Facility and beyond the projected area of measurable impact from nickel and zinc emissions, according to the 2017 Hemmera Report.

[191] Envirochem's monitoring program analyses for the chief contaminants of concerns, nickel and zinc, but not for sulphuric acid, ammonia, nitrates, chlorides, chlorine, or phosphates because they are all either volatile or soluble and would not be expected to appear in soil sampling, even if present within the soil.

[192] The first sampling event for soil, plant tissue, and surface water involved taking only one sample, but afterward Metro asked for multiple samples at each location of soil, plant tissue, and surface water (where sufficient surface water was available). All subsequent sampling events that were to inform the SPW Reports involved three samples being collected at each location, where possible. Collecting three samples allowed nickel and zinc concentrations associated with each sampling location in each sampling event to be presented as an average result with a specified standard deviation.

[193] Mr. Choi considered the first sampling event to provide a baseline for the various sampling locations as the Facility had only been operating commercially for roughly nine months at that time and he did not consider it likely that there would have been any significant impacts during that timeframe.

[194] With respect to soil sampling, the reports up to April 2020 noted fluctuating nickel and zinc levels that showed no clear trend when compared to sampling at the Background Location. Testing noted increasing nickel and zinc concentrations particularly at SL1A but, even there, results fell below provincial background levels for nickel and zinc in soil (75 mg/kg) and were below threshold concentrations for environmental impact described in the *Contaminated Sites Regulation*.[6]

[195] Surface water sampling results up to April 2020 did not indicate any trends in nickel and zinc concentrations. All results were within BCWQGs for aquatic freshwater life.

[196] Similarly, plant tissue monitoring showed no material changes up to April 2020. Because there were no standards for metal concentrations in plant tissue, Mr. Choi assessed the sampling results against normal nickel and zinc levels in similar types of plants to those in the sampling locations. Based on a literature review, he considered that normal results were up to 10 mg/kg for nickel and anywhere from 100 to 150 mg/kg for zinc (all measures based on dried weight). There were no concerning levels of nickel and zinc in plant tissue samples taken up to April 2020.

[6] B.C. Reg. 375/96.

[197] For stormwater sampling, Mr. Choi stated that he assessed measurements against the BCWQGs for freshwater aquatic life and the standards for groundwater to be used for drinking water and agriculture, as defined in the *Contaminated Sites Regulation*. Mr. Choi used all these standards because the stormwater could end up as surface water or groundwater. He described the standards as conservative benchmarks that factor in consideration of receptor or environmental sensitivities. He stated these comparisons were useful as a screener only because those standards are not applicable to stormwater or material sampled from a stormwater system but are intended to be applied to concentrations in receiving environments. He stated that dilution and other factors would reduce the concentration of nickel and zinc in the stormwater before it ever reached a receiving environment.

[198] Sampling showed elevated levels of zinc by April 2020. The details and interpretations became clearer over time and so will be discussed later in this decision.

Potential Fugitive Emissions

[199] While Ebco was operating under the 2019 Permit, all parties considered it possible that there were, at times, fugitive emissions from the Kettle leaving the Facility. Fugitive emissions are any emissions released in sufficient volume and concentration that they are air contaminants, but which are not authorized by an air emissions permit or otherwise authorized under the Act or the Bylaw. In this case, fugitive emissions are comprised of any emissions of air contaminants:

- beyond the concentrations authorized under the Permit, from either ES01 or ES02;
- not authorized under the Permit (for example, lead from ES01 or any air contaminant other than sulphuric acid from ES02), from either ES01 or ES02; or
- from any source in the Facility other than ES01 or ES02.

[200] Ebco continued to engage with Metro about the possibility of improving the capture and treatment of Smoke to reduce the chance of fugitive emissions through 2019 and for at least part of 2020. Ebco determined to take two actions to accomplish this objective: build a further containment around the Kettle and install a third baghouse to treat emissions from the Kettle. While Ebco did not agree that there was necessarily any issue with fugitive emissions, it engaged in these discussions and improvements in the interests of being a good corporate actor and maintaining a good relationship with Metro and other stakeholders.

[201] First, Ebco constructed two plywood structures (the “Secondary Containments”) to enclose the sides of the Kettle. The Secondary Containments do not enclose any of the ends of the Kettle, one side of which is not opened during Galvanizing and the other which is opened during over-length dips, during which curtains provide secondary containment. This was to prevent cross-drafts when side doors of the Kettle were open and to ensure the capture of Smoke from the Skimmings after they are removed from the Kettle. As the

Skimmings are stored within the Secondary Containments, this Smoke is captured by the venting that connects to the baghouses associated with ES01. The Secondary Containments are intended to create a secondary zone of negative air pressure around the Kettle, which is intended to operate as a primary zone of negative air pressure.

[202] Second, Ebco wished to add a third baghouse (ES01C) to assist in treating emissions from the Kettle. Ebco considered that this would strengthen the Permit by increasing suction in the Kettle and would reduce the risk of fugitive emissions.

Offsite Concerns

[203] On February 1, 2020, a mare at IronGait Farms suffered a miscarriage. This was the third in the farm's history and the third in approximately 15 months. The farm owners, Mr. Mueggenberg and Ms. Orringe, related the miscarriage to the Facility's emissions.

The 2020 Permit

[204] On January 31, 2020, Ebco applied for a further amendment of the Permit to add ES01C.

Public Notification and Consultation

[205] The Notification Regulation does not require public notification where the District Director considers that the amendment will result in an equal or lesser impact on the environment.[7] Mr. Robb considered this to be the case for the proposed 2020 Permit, but in any event decided to notify stakeholders of Ebco's application for an amendment and to invite comments. He ordered the notification of the appellants, the Township of Langley, the City of Langley, the City of Surrey, the Fraser Health Authority, Environment Canada, and the BC Ministry of Agriculture. None of the notified municipalities or government agencies expressed any concerns and public comments were provided to Mr. Robb for his consideration.

Technical Review of the 2020 Permit Application

[206] Mr. Kemp completed another technical review with respect to Ebco's requested permit amendment. He again surveyed the BACT publications from other jurisdictions and found them to be unchanged. He considered that, with the Secondary Containment, the requirement for a Fugitive Emissions Management Plan ("FEMP"), and a greater volume of air passing through the baghouses, emissions capture would improve, resulting in better emissions mitigation. Mr. Kemp added that, while there was a reduction in permitted emissions for the Facility, he was unsure if there would be any reduction in actual emissions.

[7] See section 1(2) of the *Notification Regulation*.

[207] As Mr. Kemp considered Ebco's application to amend the Permit to be a reasonable and feasible improvement to the Permit, he recommended that Mr. Robb grant Ebco's amendment application.

Air Dispersion Modelling

[208] Ebco engaged Hemmera to provide an updated opinion from the 2017 Hemmera Report, based on the proposed addition of ES01C. Hemmera provided its opinion in a report dated September 2, 2020 (the "2020 Hemmera Report"). The 2020 Hemmera Report advised that, after re-running the air dispersion exercise for the Facility with ES01C added, the maximum concentrations of all substances to be emitted were below applicable AAQOs. Furthermore, potential impacts associated with the deposition and accumulation of metals in the soil were negligible and no adverse human health or environmental impacts were expected under the proposed 2020 Permit conditions.

Technical Review

[209] Mr. Kemp explained why he did not recommend, as part of his technical review, that Metro require additional air dispersion modelling with respect to hydrogen chloride: he thought the quantity of hydrogen chloride emitted from the Facility would result in an overall concentration in the environment of less than 10% of the ambient air quality objective. He considered this would be below the sampling detection limit in the air, and less than some background level readings in the geographic area over which Metro has authority ("Greater Vancouver"). He considered the safety margin for hydrogen chloride to be sufficient, given these conclusions, without further air dispersion modelling.

[210] Mr. Kemp stated that he did not recommend Stack Testing more frequently than under the 2018 Permit because of the large amount of work required for Stack Testing.

Recommendation Memo

[211] In reviewing the recommendation memo, Mr. Robb approved of Ebco's rationale for proposing the permit amendment: increasing the volume passing through ES01 to increase the capture efficiency of the Kettle and reducing the permitted level of operating hours and emissions concentrations for the Facility. Metro encouraged this sort of proactive improvement in air emissions permits and considered permitees to be in the best position to decide how to reduce the emission of air contaminants. Metro also had a policy of granting applications for amendments of air emissions permits where the concentrations of authorized emissions were to decrease.

[212] Mr. Robb stated the improved airflow through ES01, the construction of the Secondary Containment, and the implementation of a FEMP were improvements which addressed his concern about possible fugitive emissions from the Facility, which had been the subject of discussions between Metro and Ebco leading up to the application to amend the Permit. While there was the possibility for an increase in allowable emissions (the decreased concentration being, at least at theoretical, authorized levels, more than offset by the increase in the volume of emissions), Mr. Robb considered the risk of fugitive

emissions to be the main risk of environmental impact. Accordingly, Mr. Robb considered the improved capture efficiency of the Kettle to be an improvement in the Permit.

[213] Mr. Robb noted that, while the addition of hydrogen chloride as an authorized emission under the Permit represented another theoretical increase, Mr. Robb did not think it was needed in the Permit at all, but its inclusion allowed for greater compliance monitoring and enforcement. He added that the hydrogen chloride concentration authorized for release in the proposed 2020 Permit, even without effective treatment (as he considered that baghouses do not effectively treat for hydrogen chloride), was lower than post-treatment concentrations in other air emissions permits issued by Metro. In fact, the hydrogen chloride limit in the proposed 2020 Permit was the lowest for that contaminant anywhere in Greater Vancouver at the time.

[214] For these reasons, and because of the low predicted air contaminant concentrations from the 2017 Hemmera Report (the 2020 Hemerra Report not yet in existence), Mr. Robb did not consider further air dispersion modelling or impacts analysis to be necessary. Because of the low concentration of hydrogen chloride authorized to be emitted from ES01, Mr. Robb did not consider a scrubber was needed on that emissions source. Finally, Mr. Robb did not consider it necessary to include ES02 in Stack Test requirements because it vented ambient room air from the Facility which was subject to more stringent WorkSafeBC standards than Metro's AAQOs.

2020 Permit Terms

[215] The Permit was amended in accordance with Ebco's application on July 3, 2020. The 2020 version of the Permit (the "2020 Permit") reduced the maximum allowable concentration of air contaminants from ES01A and ES01B. The 2020 Permit set the maximum allowable concentration of air contaminants from ES01A, ES01B, and ES01C at:

- 3.25 mg of ammonia per m^3;
- 1 mg of ammonium chloride per m^3;
- 0.5 mg of chlorine per m^3;
- 0.005 mg of nickel per m^3;
- 2.5 mg of zinc per m^3;
- 5 mg of particulate matter per m^3; and
- 5% opacity.

[216] Additionally, motivated by the detection of hydrogen chloride above ambient air quality guidelines in the 2018 Stack Test of ES01, Metro proposed adding hydrogen chloride as an air contaminant that could be emitted from ES01A, ES01B, and ES01C. Metro proposed a permitted emissions concentration of 3 mg/m^3 as that was the applicable limit under occupational health and safety regulations. Ebco agreed to this added term of the Permit, so it was included in the 2020 Permit.

[217] These emissions volumes in the 2020 Permit were the lowest of any permit in Metro where baghouses were used as emissions control when the 2020 Permit became effective. Of those permits requiring baghouses, some allow the emission of contaminants that are more hazardous than those authorized under the Permit, and some allow only less hazardous contaminants to be released.

[218] The 2020 Permit also added thallium to Stack Testing requirements, as this was reportedly inadvertently omitted from previous versions of the Permit, even though it had been included in the Stack Testing analyses completed before that date.

[219] The 2020 Permit also reduced the allowable number of hours of emissions from ES01A and ES01B to, and set the allowable annual number of hours of emissions from ES01C at, 8,000.

[220] The 2020 Permit eliminated the requirement that Ebco file plans and reports it had previously filed. The schedules for further report submissions were consistent with the previous version of the Permit, with the following exceptions:

- Stack Test reports for ES01A and ES01B were to be conducted together, every two years starting on October 31, 2021;
- Stack Test reports for ES01C were required every two years, starting on October 31, 2020; and
- a FEMP, to be filed by June 2021.

[221] An interim FEMP had been approved by the District Director on July 3, 2020. Ebco also submitted a draft final FEMP to Metro and, after a series of questions and comments by Metro and responses from Ebco (all of which were documented in a comment tracker maintained by Metro), the finalized FEMP was subsequently approved by the District Director.

Fugitive Emissions Management Plan

[222] The FEMP provides a general understanding of the process in the Facility, potential causes of fugitive emissions, and how to prevent them from occurring. The FEMP makes the plant supervisor responsible for ensuring that staff are trained in the procedures specified in the FEMP and that those procedures are followed.

[223] The FEMP requires the Facility to have the Secondary Containments and curtains that close around the entire length of steel protruding from the Kettle during over-length dips. The FEMP also defines operating procedures to minimize the risk of fugitive emissions that otherwise may result from Smoke escaping the Kettle—and then from the Facility—through openings other than ES01. The FEMP contemplates various operational scenarios that Ebco considered most likely to generate fugitive emissions:

- over-length dips: the open doors at one end of the Kettle lowers the emissions capture efficiency of the Kettle;

- technical dips: where the zinc coating on the steel must be kept below a specified thickness, skimming must take place before the Smoke is fully evacuated from the Kettle, reducing the capture efficiency of the Kettle;
- spinning baskets: where small parts, like bolts, are galvanized, they are submerged while in a basket, which is then spun afterward to remove excess Alloy, potentially generating additional emissions; and
- skimming: Skimmings are still smoldering when removed from the Kettle, generating some smoke outside of the Kettle.

[224] According to the FEMP, over-length dips, technical dips, and spinning baskets each comprised less than 5% of all galvanizing done at the Facility. The FEMP indicates that the three dipping scenarios described above collectively represent about 10% of the dips done at the Facility. The FEMP described process controls and dipping procedures to reduce any fugitive emissions associated with the scenarios identified in the FEMP.

[225] The requirements of the FEMP were not included directly in the Permit because Ebco was voluntarily improving its fugitive emissions reduction efforts and including the FEMP in the Permit may preclude continuous improvement of fugitive emissions management. Dr. Preston noted that Ebco continued to make improvements to the FEMP after the issuance of the 2020 Permit, saying that after she became District Director for Metro in 2022 (after Mr. Robb's retirement), she approved a further iteration of the FEMP on December 8, 2022.

Facility Operations Under the 2020 Permit

Occupational Health and Safety Testing

[226] WorkSafeBC received an anonymous complaint which led it to issue an order, on June 12, 2020, requiring Ebco to have an industrial hygienist complete a walkthrough of the facility and, if necessary, conduct air sampling to assess for risks of overexposure.

[227] It was in August 2020 that MSABC conducted the necessary walkthrough and subsequent air testing to assess the risk associated with exposure to zinc oxide and related fumes from the Kettle area, and ammonium chloride, sulphuric acid, and heat in the Production Area. As noted above, MSABC concluded there was no potential for overexposure to workers from metal particulate from the Kettle, ammonium chloride from the Flux, or sulphuric acid from the Pickling Solution.

Stack Testing

[228] Stack Testing was performed for ES01C in 2020, as scheduled under the 2020 Permit. This Stack Test involved three sampling events ranging in duration from one hour and two minutes to one hour and five minutes. The testing revealed the following substances, expressed as an average over three tests:

- total particulate (3.1 mg/m^3);

- ammonia (5.34 mg/m^3);
- ammonium chloride (0.01 mg/m^3);
- cadmium (0.00053 mg/m^3);
- chlorine (0.4 mg/m^3);
- hydrogen chloride (2.72 mg/m^3);
- lead (0.00804 mg/m^3);
- nickel (0.0018 mg/m^3); and
- zinc (0.0239 mg/m^3).

[229] Ebco reports that this Stack Test occurred during a time of unusual production: as supervisors did not understand the appropriate production levels for Stack Testing, the Facility was processing five times the normal weight of product than the hourly average over the preceding 90 days. This resulted in parts being improperly drained of flux before being Galvanized, according to Ebco. According to records Ebco submitted to Metro, product weights during the 90 days preceding the 2020 Stack Test were as follows:

Shift	Working Shifts	Total Weight (lbs)	Average (lbs/shift)	Minimum (lbs/shift)	Maximum (lbs/shift)
July Day	22	777,801	35,355	19,544	62,780
July Afternoon	12	334,404	27,867	9,294	48,522
August Day	21	678,576	32,313	19,384	43,170
August Afternoon	17	448,543	26,385	15,058	43,720
September Day	24	673,055	28,044	15,438	65,239
September Afternoon	10	324,337	32,434	3,100	58,090
Overall Numbers	106	3,236,716	30,535 pounds (average weight/shift)		

[230] Following the exceedance, Ebco arranged for another stack test during “normal operating conditions” in accordance with its method of calculation, described above. The follow-up Stack Test took place in November 2020 and involved three sampling events, each lasting one hour. Lanfranco reported that ammonia levels measured in the follow-up test, 2.48 mg/m^3, were in compliance with Permit limits.

[231] Subsequently, on March 15, 2021, Metro issued a Notice of Violation to Ebco in respect of the October 2020 emissions for emitting ammonia in excess of concentrations authorized by the Permit. Ebco responded, describing its production levels at the time and committing to switching from Perlite to diatomaceous earth as a pre-treatment material for the baghouses in ES01. Diatomaceous earth is more expensive than Perlite but is more effective at removing ammonia from emissions streams.

[232] Further Stack Testing of ES01C was undertaken at the Facility by Lanfranco in July 2021 and August 2022, as required by the 2020 Permit. Testing on each occasion involved three sampling events of each emissions source. Testing in 2021 lasted from one hour and two minutes to one hour and three minutes per sampling event. All results for air contaminants authorized under the Permit were within permitted levels. Emissions of lead, which was not authorized under the Permit, were noted to exceed the applicable ambient air quality standards (0.0015 mg/m^3) in 2022. The concentrations measured during these tests were, on average:

Substance	**July 2021 (ES01A)**	**July 2021 (ES01B)**	**August 2022 (ES01C)**
Particulate (mg/m^3)	0.6	1.6	0.73
Ammonia (mg/m^3)	0.003	0.003	0.38
Ammonium Chloride (mg/m^3)	0.004	0.012	0.17
Cadmium (mg/m^3)	0.00012	0.00006	0.00006
Chlorine (mg/m^3)	0.23	0.34	0.21
Hydrogen Chloride (mg/m^3)	0.47	0.81	0.22
Lead (mg/m^3)	0.00052	0.00046	0.00305
Nickel (mg/m^3)	0.0007	0.0005	0.0003
Zinc (mg/m^3)	0.1344	0.2373	0.0104

[233] It is unknown what levels of production occurred during these Stack Tests.

SPW Reports

[234] Mr. Choi continued to conduct sampling for the SPW Reports required under the 2020 Permit. The reports documented findings based on the available information.

[235] Nickel and zinc concentrations at SL1A were noted to have increased relatively rapidly from January 2020 to February 2021. Mr. Choi noted this period coincided with when vegetation had been removed from the Bioswale. Mr. Choi noted the Bioswale showed signs of erosion upslope from SL1A and considered that runoff from the Site may be responsible for the increase in nickel and zinc concentrations at SL1A. Mr. Choi proposed an interim sampling event for SL1A and Ebco agreed to this. The interim sampling event occurred in July 2022.

[236] Ebco also retained the engineering firm that had designed and constructed the Bioswale, to restore it to its original condition.

[237] Envirochem's soil analyses for nickel and zinc are reproduced below. For ease of reference, sampling results showing a clear increase (when assuming a one standard deviation margin of error) are highlighted in orange, while sampling results showing a clear decrease (with the same assumption) are highlighted in green.

Sample Location	Monitoring Event	Nickel, Mean ± 1 Standard Deviation (mg/kg)	Zinc, Mean ± 1 Standard Deviation (mg/kg)
1a	Feb 2019	11.1	43.9
	Aug 2019	13.4 ± 5.35	45.2 ± 5.66
	Jan 2020	17.9 ± 3.24	58.6 ± 4.22
	Feb 2021	25.3 ± 2.81	72.6 ± 6.13
	July 2022	21.3 ± 4.62	75.4 ± 8.35
2	Feb 2019	31.6	64.6
	Aug 2019	23.0 ± 11.1	50.0 ± 21.5
	Jan 2020	30.7 ± 4.39	64.4 ± 13.0
	Feb 2021	33.6 ± 4.58	71.0 ± 13.2
5	Feb 2019	35.7	94.4
	Aug 2019	23.1 ± 3.92	39.9 ± 5.06
	Jan 2020	25.1 ± 0.92	40.0 ± 3.70
	Feb 2021	26.2 ± 2.97	53.8 ± 2.42
Background	Feb 2019	15.8	31.7
	Aug 2019	14.9 ± 5.40	29.7 ± 13.5
	Jan 2020	14.4 ± 2.72	27.7 ± 6.56
	Feb 2021	17.5 ± 1.93	41.8 ± 9.15

[238] Other than for SL1A, discussed above, Mr. Choi noted some increase in nickel and zinc concentrations up to April 2021, but found those concentrations to be below the provincial background concentrations and applicable regulatory criteria. Mr. Choi added that the variation in zinc and nickel levels in the soil could be due to natural variations of the substances in the soil, and there was insufficient evidence to conclude that this variation was attributable to the Facility's emissions.

[239] Following sampling in February 2023, Mr. Choi stated that all soil sample results were in keeping with provincial background levels for nickel and zinc. There was no trend in soil sampling results to indicate any increase in nickel or zinc levels due to air emissions and there were no adverse impacts detected by the sampling program, using the reference criteria from the *Contaminated Sites Regulation*.

[240] Mr. Choi provided the analytical results from his sampling in February 2023. All results from SL01A were within or below the range of measurements from July 2022. Results from SL2 showed more variability, with sampling results found both above and below the range of measurements from February 2021. For SL5, results were within or below the range of results from February 2021 for nickel, and both above and below the range of results from February 2021 for zinc. Background Location samples in February 2023 revealed nickel and zinc levels at or below the ranges at the Background Location in February 2021.

[241] With respect to surface water, the SPW Reports from 2019 to 2021 indicate no apparent impacts with respect to nickel and zinc concentrations, relative to BCWQGs. No trends in nickel or zinc concentrations were observed. The results are summarized below. For ease of reference, sampling results showing a clear increase (when assuming a one standard deviation margin of error) are highlighted in orange, while sampling results showing a clear decrease (with the same assumption) are highlighted in green.

Sample Location	Monitoring Event	Nickel, Mean ± 1 Standard Deviation (µg/L)		Zinc, Mean ± 1 Standard Deviation (µg/L)	
		Total	Dissolved	Total	Dissolved
2	Feb 2019	0.71	0.58	6.1	4.4
	Aug 2019	1.87 ± 0.588	<0.5 ± 0	7.0 ± 2.98	1.7 ± 0.15
	Jan 2020	1.82 ± 0.170	0.76 ± 0.025	12.0 ± 0.93	7.4 ± 0.10
	Feb 2021	1.57 ± 0.049	0.84 ± 0.015	8.8 ± 0.47	6.1 ± 0.20
5	Feb 2019	1.17	1.78	3.7	7.4
	Aug 2019	-	-	-	-
	Jan 2020	2.99 ± 0.19	1.06 ± 0.049	12.1 ± 0.17	6.4 ± 1.08
	Feb 2021	2.62 ± 0.07	1.46 ± 0.031	10.7 ± 0.70	7.8 ± 0.06
Background	Feb 2019	0.77	0.58	3.2	2.1
	Aug 2019	14.9 ± 0.038	0.59 ± 0.046	<3 ± 0	2.9 ± 0.47
	Jan 2020	14.4 ± 0.070	0.60 ± 0.040	6.6 ± 2.89	3.5 ± 0.15
	Feb 2021	17.5 ± 0.029	0.64 ± 0.035	3.7 ± 0.49	3.4 ± 0.15

[242] Mr. Choi stated that surface water sampling up to and including February 2023 had not identified any trend of increasing nickel and zinc contributions attributable to the Facility. He stated that there were no indications of negative impacts because there were no exceedances of relevant reference criteria.

[243] The raw data Mr. Choi supplied of sampling in February 2023 indicate that all surface water samples at SL2 revealed nickel and zinc concentrations (both dissolved and total that were within or below the range of samples from February 2021. For SL5, all results were below the range of samples from February 2021. Results for nickel at the Background Location were mixed: all concentrations of total nickel were lower than the range of samples from February 2021, but levels of dissolved nickel were all higher than the range of samples from February 2021. Background Location measurements for zinc, both total and dissolved, were all lower than those from February 2021.

[244] With respect to plant tissue sampling, testing from April 2019 to March 2023 revealed results that were within one order of magnitude of one another, showing limited variability. The measured levels of nickel and zinc in plant tissues were considered to be within natural background variations given the plants sampled. Results from February

2021 and February 2023 indicated that samples from SL1A exceeded typical zinc concentrations in crop and posture plants and fell within the range of potential zinc toxicity, but were typical for Boston Ferns, which were not present at that sampling location but were considered analogous to the species there. As such, results were inconclusive.

[245] The plant tissue monitoring results are summarized below, with increases highlighted in red and decreases highlighted in green:

Sample Location	Monitoring Event	Nickel, Dry Weight (mg/kg)	Zinc, Dry Weight (mg/kg)
1a	Feb 2019	1.55	55.4
	Aug 2019	2.19	53.6
	Jan 2020	2.29	61.8
	Feb 2021	1.99	125
	July 2022	2.99	81.0
	Feb 2023	2.69	124.0
2	Feb 2019	4.11	37.0
	Aug 2019	6.32	43.4
	Jan 2020	7.32	48.1
	Feb 2021	6.27	47.6
	Feb 2023	6.48	38.5
5	Feb 2019	1.03	23.9
	Aug 2019	1.19	27.0
	Jan 2020	1.57	35.9
	Feb 2021	0.87	31.7
	Feb 2023	0.7	30.0
Background	Feb 2019	1.66	28.7
	Aug 2019	1.81	34.1
	Jan 2020	1.87	36.1
	Feb 2021	1.17	33.5
	Feb 2023	0.99	34.3

[246] Mr. Choi noted an increase in the zinc content of plant tissue at SL1A in 2021 but did not consider there to be any concerning trends at that time. There were no other trends identified.

[247] With respect to stormwater, each SPW Report noted that various samples exceeded criteria from the BCWQGs and the *Contaminated Sites Regulation*; however, those criteria were noted to apply in the receiving environment and not within a stormwater collection system or within stagnant water within a stormwater collection system. The SPW Reports up to April 2020 document that concentrations of nickel and zinc in the stormwater system were highest on the west side of the Facility, where galvanized materials had been stored. The reports indicate that results were not as would be expected if the nickel and zinc in the stormwater system resulted solely from stack emissions.

[248] The reports from 2019 to 2021 note that zinc concentrations should be or could be mitigated to ensure stormwater quality is improved in the event of a 1-in-100 years storm event, which would lead to stormwater discharge into the City of Surrey's stormwater system.

[249] Stormwater sampling data is summarized below, with increases of nickel and zinc concentrations highlighted in red and decreases in those concentrations highlighted in green:

Sample Location	Monitoring Event	Nickel (µg/L)		Zinc (µg/L)	
		Total	Dissolved	Total	Dissolved
LD-2	Feb 2019	5.5	<0.5	16.5	4.6
	Aug 2019	2.45	2.19	20.9	10.6
	Jan 2020	1.89	<0.5	35.5	10.5
	Feb 2021	0.62	<0.5	138	119
	Feb 2023	1.01	0.52	42.2	34.3
LD-7	Mar 2019	87.6	84.0	4,680	4,400
	Aug 2019	5.37	5.16	599	543
	Jan 2020	2.36	1.80	747	663
	Feb 2021	60.4	66.4	13,200	14,900
	Feb 2023	22.3	20.3	3,070	2,800
LD-9	Feb 2019	9.97	9.33	4,760	4,840
	Mar 2019	1.46	1.21	1,980	1,740
	Aug 2019	10.7	10.6	5,680	5,680
	Jan 2020	3.18	2.47	2,880	2,520
	Feb 2021	3.83	2.47	3,680	3,120
	Feb 2023	2.02	1.56	2,540	2,370
LD-10	Feb 2019	1.78	1.48	62.6	54.6
	Aug 2019	4.56	4.02	199	162
	Jan 2020	1.58	1.13	269	224
	Feb 2021	2.62	1.88	1,110	940
	Feb 2023	2.90	2.65	2,060	2,110

LD-11	Feb 2019	1.37	1.10	315	287
	Aug 2019	2.79	2.65	174	166
	Jan 2020	1.16	0.70	224	190
	Feb 2021	1.96	1.38	1,140	1,010
	Feb 2023	2.47	1.93	1,020	996
Separator	Feb 2019	2.20	2.10	99.4	91.4
	Aug 2019	0.90	8.7	6,260	5,970
	Jan 2020	3.35	1.43	2,720	1,990
	Feb 2021	2.70	2.56	2,090	2,120
	Feb 2023	2.22	2.22	3,490	3,290

[250] Mr. Choi stated the data did not suggest that air emissions of nickel and zinc were responsible for the increasing concentrations of those metals in the stormwater sampling locations. He stated that elevated readings were focused on the west side of the Site, not distributed more evenly as he would expect if the readings related to air emissions.

[251] Mr. Choi stated that it was also possible that the nickel and zinc was flowing into the lawn drains in runoff from the Site. He considered the most likely explanation to be the storage of newly galvanized products outside, on the pavement upgradient from the lawn drain, or other related sources. Mr. Choi noted that the highest nickel and zinc readings were recorded at lawn drains nearest to where galvanized material was stored outdoors, supporting this theory.

[252] To address concerns about air deposition of nickel and zinc possibly contributing to increasing concentrations of nickel and zinc in stormwater, Envirochem proposed a dustfall sampling program. Ebco agreed and Envirochem completed a proposal for additional air deposition at the Site. This proposal was completed in 2020 and was under consideration by Metro at the close of the hearing for these appeals.

[253] Ebco also consulted with other galvanizers and discussed the elevated metals concentrations in the stormwater or stormwater system, and sought advice on minimizing the effect of metals storage on the Site. Consequently, Ebco implemented a management plan to minimize the effect of metals storage. The measures adopted included increased sweeping and vacuuming in the Facility to protect against zinc dust being tracked out to the yard where it could be carried away by runoff, covering scrap metal stored outdoors, reducing the number of items stored outside, and bagging filters when they were removed from baghouses for cleaning.

[254] Overall, Mr. Choi stated there was insufficient information to indicate any trend of increasing nickel or zinc concentrations due to the Facility, although he considered there to be areas requiring further assessment and that more data would provide increased clarity as the sampling program continued.

Public Complaints

The Complaints Process

[255] Metro can receive complaints on air quality or air emissions, 24 hours a day, by telephone or email. Each complaint is logged into a database and is assigned to an officer within 24 hours. Metro receives up to approximately 4,000 complaints per year. Because of this workload, officers return calls only when requested to do so.

[256] Where a complaint pertains to a permitted facility such as the Facility, Metro refers the complaint to the permittee for comment. All complaints discussed in the context of these appeals were attributed to the Facility by the complaining party.

[257] When receiving a complaint referred from Metro, Ebco undertakes an investigation. Typically, this is done by Mr. E. Eppich. Mr. E. Eppich reviewed each complaint and attended the Facility to investigate. If the complaint described a visual disturbance like smoke, he checked records associated with Galvanizing to see if there was an upset condition that could have resulted in the release of Smoke. He also looked for any significant Pickling events that could be associated with a large volume of water vapour being released. He also checked wind data, temperature, and humidity information to gauge whether there was a possible misidentification of fog or other water vapour, or a possible misattribution of some phenomenon to the complaint where windspeeds and wind directions are incompatible with such a conclusion.

[258] For odour complaints, Mr. E. Eppich considered the nature of the complaint and whether these were consistent with what he thought could be generated by Pickling steel or by Galvanizing. Mr. E. Eppich stated that Pickling is odourless as sulphuric acid is odourless, but causes at most a pinching sensation in the nose. He stated that the Smoke can smell like road salt. He stated that he personally went on the roof of the Facility to verify the lack of odour associated with Pickling while it was occurring.

[259] After investigating, Mr. E. Eppich reported a conclusion to Metro. He variously described these complaints as misidentifications, misattributions, both, or possible or probable emissions from the Facility.

[260] Mr. E. Eppich considered complaints to be misidentifications where his review of meteorological data supports that there was likely fog or other naturally occurring phenomenon in the area that were being described as emissions. In any event, he also followed up with Ebco's employees to reinforce the importance of following standard operating procedures.

[261] Mr. E. Eppich considered complaints to be misattributions where they:

- described odours not associated with galvanizing, such as rotten eggs, sourness, gas, skunk, smoke, garbage, acid, sulphuric acid, battery acid, rotten food, wood, dirtiness, mustiness, and fabric softener;
- were from a time when there was no Pickling or Galvanizing going on at the Facility;
- there were no "upset conditions" in the Facility's operations and so visual emissions were likely water vapour;
- were made at times that fog was present that could account for observations that were the subject of the complaint;
- were inconsistent with the Facility being the source of the subject matter of the complaint based on wind direction and windspeed.

[262] Metro also assesses each complaint. It considers the response (if any) from the permittee, wind direction data from the time of the complaint, and may do a site visit, if feasible. The assigned officer determines if the permitted facility was confirmed to be the source of the event that generated the complaint, likely the source of that event, possibly or potentially the source of that event, or unlikely the source of that event. Sometimes, Metro staff will not comment on the likelihood of the permitted facility having generated the event, but rather describe the cause as unknown.

[263] Metro's policy is that, if a complainant requests a follow up with an assigned officer, that officer will contact the complainant in any given case to advise of the outcome of the investigation and to discuss the matter further before closing the complaint. Complaints are expected to be closed within one month.

[264] Ebco also has a process for when it receives complaints from the public directly; however, Mr. E. Eppich testified that Ebco received no such complaints up until he testified on June 7, 2023. As such, Ebco's process is not described in further detail.

Complaints about the Facility

[265] The number and source of complaints has changed over the years that the Facility has been operating. Several complaints were filed with Metro during the setup of the Facility, before the Approval was in place.

[266] Ebco acknowledged being a source of emissions on several occasions before the Approval was in place. Ebco described fumes or emissions related to welding in the Facility or to lifting the Kettle from the Galvanizing Tank without ES01 active while heating the Galvanizing Tank, or while checking the Galvanizing Tank's temperature. On other occasions, Ebco denied that any operations were ongoing at the Facility at the time of some complaints and stated that the Facility was not responsible for the subject matter of those complaints.

[267] While the Facility was operating under the Approval, this pattern continued: Ebco acknowledged, at times, that their activities were possibly or probably responsible for

isolated complaints. Ebco explained these occasions as ones where construction or improvements were ongoing or where standard operating procedures were not followed by Galvanizing staff.

[268] In 2018, Metro received 28 complaints about the Facility, principally from Mr. Mueggenberg, the Thielemanns, Ms. Tompe, and Ms. Orringe. From 2019 until the end of the hearing with respect to these appeals, 113 complaints were filed with Metro from two addresses: IronGait Farm and the Thielemanns' home.

[269] Several of the complaints throughout the Facility's operating history describe fog, haze, mist, or vapour emerging from or in the area of the Facility. Some include photographs that either show such emissions emerging from the Facility or document the presence of such phenomena in the area of the Facility. Witness testimony supported that several witnesses, most particularly the Thielemanns, Mr. Mueggenberg, and Ms. Orringe, either ascribed these phenomena to the Facility or observed them within the Facility's vicinity. These witnesses also described a range of sensations, including unpleasant odours and acid-like sensations.

[270] Ebco's investigations concluded, over that timeframe, that only three complaints were attributable to the Facility: two in respect of visual emissions from Galvanizing when Kettle doors were not appropriately closed by staff and one in respect of an odour complaint related to Galvanizing, also attributable to staff error. The most recent of those complaints was in 2019, and Ebco addressed the issue with staff and took remedial action in each case.

[271] Metro's investigations concluded that many were misattributions for the following reasons:

- the Facility was not operating (neither Pickling nor Galvanizing was occurring);
- visible phenomenon described as emissions were considered more likely to be fog or water vapour released from the Facility;
- reported odours were considered inconsistent with operations at the Facility; or
- reported odours or visual phenomenon were considered to not have originated at the Facility because of the prevailing wind direction before, and at the time of, the event complained of.

[272] At times, Metro considered the Facility to be a likely or possible source of visual fog, haze, or similar. More often, Metro's investigation was indeterminate.

Appeal Procedure History

[273] The procedural history in this appeal is complicated. Thirteen appeals were filed in respect of the 2018 Permit by a variety of individuals, corporations, and societies. The

District Director was named as the respondent in each case. Ebco, as the holder of the Permit, was designated as the third party.

[274] Of the thirteen appellants of the 2018 Permit, one was found to lack standing to appeal, while others withdrew their appeals before the end of the hearing. Some of the remaining appellants appealed each of the 2019 Permit and 2020 Permit: there were no new appellants of those iterations who had not also appealed the 2018 Permit.

[275] The 2019 Permit became effective in March 2019, shortly before the hearing with respect to the 2018 Permit was to begin. Two parties appealed the 2019 Permit: both appellants of the 2018 Permit. The appeals of the 2019 Permit were joined with those of the 2018 Permit and the hearing began as scheduled on April 15, 2019.

[276] Hearing dates were held in April 2019 and February 2020. After these hearing days, the appellants had finished calling evidence with respect to the appeals of the 2018 and 2019 versions of the Permit. The District Director had provided their evidence, apart from one witness remaining. Ebco had yet to present any evidence.

[277] The hearing was scheduled to resume in August 2020. Before this, the parties advised that the 2020 Permit had been enacted. The Board decided to join the appeals of the 2020 amendment of the Permit to the existing grouped appeals and proceed with the hearing. The hearing was then reconvened as scheduled in August and September 2020.

[278] Additional hearing time was required for the appeals of the 2020 Permit amendment, and the Board reconvened the oral hearing in September, October, and December 2022, as well as in February, April, June, and August 2023. Submissions were completed in writing on April 3, 2024.

[279] This decision addresses the remaining appeals—those that have not been dismissed or withdrawn, totaling eighteen—of the 2018 Permit, 2019 Permit, and 2020 Permit, all on their merits.

PRELIMINARY ISSUES AND DECISIONS

Document Production

[280] Generally, requests for documents were resolved between the parties or with minimal intervention by the Board. With respect to an early contentious application from one of the Appellants, Mr. Mueggenberg, asking the Board to compel Ebco to produce documents, the panel indicated reasons would follow with respect to its decision to grant the appellant's application.

The Positions of the Parties

[281] Mr. Mueggenberg's request was for documents related to the quantity and nature of materials that were galvanized on and around the Stack Tests performed in 2016: from

June 13 to 16, 2016 and from August 22 and 23, 2016. He also sought production records for dates around when two foals were miscarried at IronGait Farm: January 2 to 6, 2019 and February 8 to 13, 2020. Mr. Mueggenberg and IronGait considered that emissions from the Facility may have been at least partly responsible for the miscarriages.

[282] Ebco opposed Mr. Mueggenberg's request for document production. Ebco stated that the production records from 2016 were irrelevant as they pertained to operating dates before Ebco even applied for, or while the Facility was operating under, the Authorization. With respect to the 2019 and 2020 dates, Ebco argued that there was no evidence to establish a causative connection between its emissions and the foal miscarriages and no expert evidence on the subject.

[283] Mr. Mueggenberg responded that variability in the Facility's operations meant that emissions were variable over time. He queried how to know whether the stack testing was reliable without having production information from the time of batch testing. With respect to the 2019 and 2020 dates, Mr. Mueggenberg asserted that there were laboratory results to be distributed amongst the parties related to the miscarriage of the foals and that the case had yet to be made, and that it could not be made without the information on production from around the time of the miscarriages.

[284] Ebco responded that many documents that the appellants had jointly disclosed were inadmissible. Some of the documents, including peer-reviewed studies, did not consider the facts of this case and were not useful.

The Panel's Findings

[285] Section 34(3)(b) of the *Administrative Tribunals Act*, SBC 2004, c. 45, allows the Board to order a party to produce a document or other thing that is within their possession or control, admissible to the Board, and relevant to an issue in an appeal.

[286] The test to be applied by the Board, as noted in the Board's *Practice and Procedure Manual*, was articulated in *Seaspan ULC (formerly Seaspan International Ltd.) v. Domtar Inc.*, 2013 BCEAB 11 (CanLII) (*Seaspan*). The analysis in this case has been repeatedly used by the Board. While it is not binding on the panel, the panel agrees with it and adopts it here.

[287] According to *Seaspan*, possession means a proprietary interest. Control means either possession of the document or thing at issue, or an enforceable right to obtain the documents from whoever has possession of them. Relevance is determined by whether the documents or other things may serve to prove or disprove a material issue within the appeal.

[288] Mr. Mueggenberg asserted that Ebco had possession and control over the production records he sought. This was not disputed by Ebco. The first branch of the test for document production is accordingly satisfied.

[289] Ebco likewise does not dispute that the requested documents are admissible, other than on the basis of relevance. Accordingly, pending a decision on the requirement that

the documents be relevant, the second branch of the test for document production is satisfied.

[290] Ebco argues that the 2016 documents are irrelevant because they relate to Galvanizing before the Permit was in effect. While this is true, the 2016 Stack Test was used, at least in part, to define the concentration of contaminants that would be authorized under the Permit. Whether production during the 2016 Stack Test was representative of operations at the Facility generally may inform the reliability of the data gathered during that Stack Test and therefore the reliability of the "normal operations" air dispersion modelling that was based on that data, as well as on elements of the Permit similarly based on the Stack Test. The 2016 Stack Test underlies central issues in this appeal and the panel is satisfied as to its relevance.

[291] Ebco argues that the 2019 and 2020 documents are irrelevant because they cannot be related to the miscarriage of foals at IronGait Farm based on the evidence already shared between the parties by the appellants. The panel recognizes this concern but the test for relevance includes that which may be relevant to the appeal. The panel considers that Mr. Mueggeberg should have the opportunity to assess the available information concerning the miscarriages of foals at IronGait Farm.

[292] It is true that the Board's Rules indicate that no further documentary evidence, expert or otherwise, would generally be permitted by the time Mr. Mueggenberg sought document production from Ebco. In certain circumstances, however, the Board may deviate from its rules. One such occasion might be in this case, where Mr. Mueggenberg sought documents from Ebco, and Ebco has refused to voluntarily disclose those documents. The panel could not conclude that Mr. Mueggenberg would necessarily be denied the opportunity to supplement their evidence in these circumstances, so it remains that the evidence sought by Mr. Mueggenberg may assist in determining whether there were periods of atypically intense galvanizing at Ebco around the dates of the foal miscarriages in 2019.

[293] No other concerns as to relevance were raised and the panel saw none. Accordingly, the panel ordered production of the documents.

Exclusion of Lay Witnesses

[294] Ebco asked that any lay witnesses who were not parties to the appeals be excluded from hearing the evidence of other witnesses. The panel confirmed that this was standard practice and, without any objections from the appellants, made the order. As such, Mr. Ryzak, Mr. Geraldo Lavent, and Mr. Thomas Wood were excluded from the hearing on the request of Ebco.

[295] Mr. McNiese asked, during the presentation of the appellants' evidence, that Mr. E. Eppich be excluded from the hearing room before providing his testimony as part of Ebco's case. The panel denied this request on the basis that Mr. E. Eppich was present as

the representative of Ebco, which is a party to the appeal. Absent any exceptional circumstances, which are not present in this case, the representative of a party could not be excluded from the proceeding.

Reports Tendered as Expert Evidence

[296] Mr. Mueggenberg sought to introduce scholarly articles to describe the uptake of zinc and other contaminants of concern in fish. Ebco objected, arguing that this literature did not pertain to the circumstances described in this appeal. Mr. Mueggenberg stated that these reports would be useful for the panel in providing information on the impacts certain contaminants would have on fish health.

[297] Separate from this, counsel for Metro attempted to introduce a scientific report of unknown authorship during the hearing.

[298] In both circumstances, the panel considered *Cambie Surgeries Corporation v. British Columbia (Medical Services Commission)*, 2016 BCSC 1739 (CanLII), and the cases it references, including *R. v. Marquard*, 1993 CanLII 37 (SCC). Those cases provide authority, with which the Board agrees, that a scholarly article may only be admitted if it is adopted by an expert, either in direct examination or cross-examination, and only for the purposes as referenced by that expert. As explained in *R. v. D.D.*, 2000 SCC 43 (CanLII), at para. 55, scholarly articles are not independently admitted, but rather are admitted as part of the explained rationale of an expert witness.

[299] With respect to the articles sought to be admitted by Mr. Mueggenberg and Metro, no expert witness had reported considering the articles so the Board did not allow them to be admitted at the time.

Information Shared on Short Notice Between the Parties

[300] Due to the length of the hearing, there were several times where a party obtained relevant information that they wished to submit to the panel. Overall, where parties were diligent about sharing the information amongst themselves, the panel allowed the admission of late evidence and confirmed with the other parties that they had sufficient time to prepare questions of any witnesses about this material. Examples include environmental sampling results, which often became available at times when the hearing was actively proceeding.

[301] Where the parties failed to share newly available information promptly, the panel was more strict about its admission into evidence. In particular, the appellants had gathered drone footage of the Facility on two dates in 2019 and 2020. Upon hearing of this, the panel directed the appellants to provide the footage, or images extracted from it, to the other parties if the appellants wished to admit the footage into evidence.

[302] The appellants did not do so and, months later, sought to put the footage, or pictures extracted from it, to a witness. The panel refused to admit the evidence because of lack of notice and because of the generally low probative value of the evidence, as well as its duplicative nature with other images of the Facility presented in evidence.

EVIDENCE

[303] Not all evidence provided by witnesses appears below. Much of the evidence has been described, without specific attribution, in the Background section above. This was done in the interests of efficiency where the evidence is non-contentious. Where witness' testimony is not summarized below, it is not because the panel did not consider their testimony: the testimony may have been accepted as uncontroversial fact or not have been associated with any persuasive arguments in the appeal, including because it fell into one of the categories described below.

Inadequately Supported Concerns

[304] The appellants raised a number of concerns in the hearing for which insufficient evidence was provided to substantiate them as live issues. The Board afforded the appellants considerable latitude to explore these issues because they were unrepresented or lay representatives without prior experience in a hearing before the Board. Nonetheless, while the panel has considered these concerns, they are not discussed beyond the summaries below. Similarly, where the appellants raised issues over which the Board has limited or no jurisdiction, those issues are summarized below.

Assertions About Economic Losses

[305] Some of these concerns relate to property value or business impacts, including sale prices for crops or animals raised to be sold on farms near the Facility. The appellants did not present sufficient evidence to establish the value of any real estate or of business sales, or sufficient evidence to demonstrate the goodwill or reputational value of their businesses, let alone impacts related to the Facility's operation.

[306] These concerns included Mr. Mueggenberg being concerned about his ability to sell fish and beef raised on IronGait Farm, the Thielemanns being concerned about being able to re-certify their farm as organic and to sell their hay to other organic-certified operations, and Ms. Kroecher being concerned about being able to sell fruit and vegetables from her garden.

Assertions About a Former City Manager

[307] Mr. Mueggenberg expressed concerns about what he considered to be Ebco's involvement with a former city manager for the City of Surrey. Mr. Mueggenberg's

concerns related to rumours he had heard about the reasons this former manager ceased to work for the city and considered the former manager to have helped Ebco secure approvals for the Facility in a way that prejudiced his rights and the rights of other property owners nearby to object to these approvals being issued. He did not provide sufficient evidence to substantiate any of these concerns, or even that the former city manager worked for or with Ebco.

[308] Given the above, Mr. Mueggenberg did not provide sufficient evidence to establish that Ebco had any association with the former city manager, that the former city manager's involvement would be concerning, or that Ebco engaged in any behaviour that inappropriately prejudiced the legal rights of Mr. Mueggenberg or other property owners.

Seeking the Banning of Certain Potential Air Contaminants

[309] Some of the appellants sought the banning of certain potential air contaminants generally, including lead and soluble nickel. The Board's jurisdiction in these appeals, as explained above, pertains to the various iterations of the Permit that have been appealed. The Board does not have the authority to ban the authorization of the release of any particular air contaminants generally. The Board may consider whether specific, potential air contaminants should not be authorized under the various iterations of the Permit in this case, but its decision-making authority does not extend to air emissions permits generally or to Metro policies on air quality or the emission of air contaminants.

Stormwater Concerns

[310] Some of the appellants asked that the Board take steps to protect the Brookswood Aquifer from being recharged by contaminated stormwater from the Site. Some appellants were also concerned about runoff from the Site, flowing to the west, to Mr. Ryzak's property and into Erickson Creek. As noted above, these appeals address the Facility's Permit. These appeals do not relate to stormwater management, including any runoff, at the Site: the Board can only address the air contaminants authorized to be emitted from the Facility, and the terms of the Permit under which those authorizations are found.

Questions of Lay Witnesses on Matters of Expert Opinion

[311] Several witnesses who may have expertise in areas relevant to the issues in these appeals were not tendered as expert witnesses. For example, Metro's lay witnesses—Mr. Robb, Dr. Preston, and Mr. Kemp—are all well-educated and have considerable experience in the measurement, control, treatment, and dispersion of air contaminants. Because they were not tendered as expert witnesses, however, the Board could not rely on any of their opinions that are based on their areas of potential expertise.

[312] The panel refused to allow questions that contradicted this limitation. While there was a logical relevance to such questions, this evidence did not meet the threshold for

admission into the appeal proceeding. Referencing the test for the admission of evidence from *R. v. Mohan*, 1994 CanLII 80 (SCC) (*Mohan*), the panel noted that the probative value of the evidence must be weighed against its prejudicial effect.

[313] In this case, the probative value of these opinions from untendered, potential experts was generally low. The opinions of Dr. Preston and Mr. Kemp were part of the recommendation memos provided to the District Director with respect to each iteration of the Permit. Those opinions were inadmissible for the value of the opinion as described above. Opinion evidence from Dr. Preston and Mr. Kemp would have assisted only insofar as establishing a narrative for the recommendations put before the District Director. The District Director was the statutory decision-maker in this case. The recommendations made to him were non-binding and the Board cannot rely on either the opinions of Dr. Preston and Mr. Kemp or on any reliance the District Director made on those opinions, as the Board owes the District Director no deference in this case.

[314] Weighing against this low probative value, the prejudicial effect of hearing this evidence was high. The technical opinions of Dr. Preston and Mr. Kemp were inexorably intertwined with their expertise obtained through education, training, and experience. The admission of those opinions would risk tainting the narrative history of Metro's processes with inadmissible opinion evidence. Allowing these questions would also open Dr. Preston and Mr. Kemp to cross-examination by the other parties to the appeal on their opinions. Given the already considerable length of the hearing by that point, further prolongation of the appeal was a significant concern. This concern was exacerbated by the fact that the appealed Permit remained effective throughout this time period, resulting in the continuing collection and submission of evidence over the life of the appeal.

[315] Where Metro and Ebco objected to the panel's ruling on this issue, the panel referenced the test from *Mohan*, provided an overview of the analysis above, and invited submissions. The parties declined to provide submissions on the issue. Dr. Preston and Mr. Kemp were accordingly precluded from providing expert opinion evidence with respect to the technical review.

[316] The opinions of Mr. Robb were treated differently. As Mr. Robb was the statutory decision-maker with respect to the appealed decisions, his thought process was considered relevant and of significantly higher probative value. The panel considered this value to outweigh the prejudicial effects of hearing his evidence, namely that the Board would need to separate his inadmissible opinions from the historical insight Mr. Robb provided into the permitting process and his assessment of appropriate terms for the various iterations of the Permit at issue in this decision.

[317] Mr. E. Eppich also may have relevant expertise due to his education, training, and experience in galvanizing. He was not tendered as an expert and was not the decision-maker, but had direct experience with the Facility that was not otherwise available to the panel. As such, Mr. E. Eppich's testimony included some opinions that rely on his experience and the panel allowed those questions to be asked, but as set out above, did

not rely on the contents of those opinions which are based on his education, training, and experience. The panel has relied on those opinions purely to establish the narrative surrounding the permitting process and operations at the Facility, and in particular to understand why Ebco did or did not do certain things as events pertaining to the Approval and Permit unfolded.

The Appellants' Lay Witnesses

Mr. Mueggenberg

Personal Observations

[318] Mr. Mueggenberg testified as to his personal observations he attributed to the Facility's operations.

[319] He testified that, from before the Approval was in place until the time he gave evidence in the hearing, he regularly saw fog, haze, mists, or smoke that he attributed to the Facility. He stated that the Facility's emissions tended to stay low to the ground, not behaving like steam. He stated the emissions were more noticeable in cool and wet weather, where the emissions were more prone to condense. Mr. Mueggenberg stated that he did not report every incident to Metro. As time went on, he reported only the most significant events.

[320] Mr. Mueggenberg testified that he had not seen similar fogs, mists, or vapours before the Facility was present despite having lived in the area for many years. Mr. Mueggenberg stated these experiences were not in keeping with the odourless, colourless description of emissions from ES02, but considered them more in keeping with Smoke.

[321] Mr. Mueggenberg also reported incidents where he experienced sensations he attributed to exposure to sulphuric acid (which he had experience with while dealing with car batteries), including an unpleasant feeling in and about the mouth, an unpleasant taste or a taste-like sensation, and a desire to spit. According to Mr. Mueggenberg, these events continued after the Approval was stayed (and not at times associated with the 2016 Stack Testing).

[322] According to Mr. Mueggenberg, the wind in the area (as shown by a windsock on his barn) predominantly blew from the east and northeast, pushing effluent down toward Mr. Ryzak's property, Erickson Creek, IronGait Farm, and the Thielemanns' farm.

[323] Mr. Mueggenberg also described observing unusual circumstances around IronGait Farm after the Facility began operating and queried whether these circumstances related to the Facility's air emissions. Two formerly robust Douglas firs located about 200 metres from the Facility died without any obvious reason. Five-to-six-year-old alders in the area died at an unusual rate, without any apparent cause. Furthermore, he had observed a decrease in the population of barn swallows and bats at IronGait Farm since the Facility began operating.

Critique of Ebco's Facility

[324] Mr. Mueggenberg took issue with Ebco's communications before the Facility was built, that it would be state of the art. He described galvanizing facilities that he toured in several countries. He described how various facilities used mass balancing to track emissions and acid-neutralizing scrubbers to treat emissions. He also described one facility that was built to include separate "cells" to house different elements of the galvanizing process. He thought these were hallmarks of a state-of-the-art facility.

[325] By contrast, Mr. Mueggenberg considered gaps in the Kettle allowed Smoke to escape into the interior of the Facility and to eventually become fugitive emissions. Mr. Mueggenberg stated that he had observed Smoke pouring out of open doors of the Kettle, into the interior of the Facility and then out of the building, while watching galvanizing with binoculars from beyond the Site's fenceline.

[326] Mr. Mueggenberg also described having observed plastic curtains in the Facility on and around the time of the 2016 Stack Test. He stated that, with this change, emissions were not released from the Facility in the same way, although the curtains were later removed. Mr. Mueggenberg was concerned that Ebco sectioned off portions of the Facility to artificially improve their emissions during the 2016 Stack Test.

Ms. Orringe

[327] Ms. Orringe described several instances where she attributed symptoms she experienced on IronGait Farm to emissions from the Facility. Those are described previously. In one such instance, she reported that a silver necklace she was wearing tarnished quickly, while she was wearing it, in the barn on IronGait Farm, while tending to the miscarriage of a foal.

Thomas Wood

[328] Mr. Wood testified that he had been at IronGait Farm late in 2018 when he observed what he considered to be emissions coming from the Facility. He attempted to take pictures on his phone but had difficulties doing so, so he picked up Gerardo Levert from IronGait Farm to assist him.

[329] Mr. Wood reviewed pictures taken from his phone and by Mr. Levert on that day. He described observing clouds of emissions coming from ES02 and the south end of the Facility, with more coming out of ES01. He stated that he observed similar such emissions at various times, most recently the week before his testimony (April 25, 2019).

[330] In cross-examination, Mr. Wood stated that he believed the moisture on the sideview mirror in one photograph related to rain the previous night. Mr. Wood stated that the roads were wet, as exhibited in some photographs.

Gerardo Levert

[331] Mr. Levert testified that, on November 29, 2018, Mr. Wood drove him to the Facility. Mr. Levert testified that it was not humid or foggy. He recalls it having been 8 to 12 degrees based on the time of year. He did not research weather conditions since that day and testified based on his memory. Mr. Levert stated he saw some gaseous emission from the south end of the Facility and ES02. Nothing visible was coming from ES01. The emission was travelling south or southwest from the Facility, along the ground as it seemed heavier than air.

[332] Mr. Levert stated that exposure to the fog dried out his mouth in a way that he recognized, but he was unsure what the contents of the fog were.

[333] In cross-examination, he was directed to a photograph taken from his vehicle on that day. The photograph showed droplets of water on a sideview mirror, but he did not recall it raining. Ebco suggested this was dew and Mr. Levert disagreed but stated that he drove through an area of low elevation that tends to accumulate more fog than other areas. He considered it possible that the apparent moisture was, in fact, dust.

[334] Mr. Levert considered it possible, but unlikely, that the emission was steam.

Inge Thielemann

[335] Ms. Thielemann lived, at least up until the hearing was underway, at her farm, roughly 500 metres from the Site. She stated that winds on her property almost always blow from the southeast, the direction of the Facility. She stated that her house was downslope from the Facility.

[336] Ms. Thielemann stated that, before the Facility opened, she enjoyed the “country life” at her farm. She testified that has seen fewer birds and animals at her farm since the Facility opened.

[337] She considers that she has been exposed to “poisonous chemicals” from the Facility since it opened and she is concerned for her health, the health of her husband, and others who are or will be impacted by the Facility. She has ascribed suffering and deaths of animals on her farm to emissions from the Facility.

[338] She described a particular incident on May 24, 2016, when she was outdoors with her husband and animals. She described a cloud rolling in from the southeast, along the ground. She reported that the cloud had an overwhelming, nauseating, acidic smell and made it hard to breathe. She stated that her husband’s face turned red and he described a burning sensation. The animals seemed distressed to her.

[339] Ms. Thielemann stated she covered her nose and mouth with fabric and brought the animals indoors. She closed the windows and doors. She described experiencing persistent symptoms after this exposure and says she was left with a rough voice.

[340] Ms. Thielemann reported that afterward, at night, she kept her windows closed and her animals indoors. She described repeated exposures to what she considers to be emissions from the Facility, which give her burning eyes, shortness of breath, roughness in her voice, and coughing. She stated her husband experiences severe shortness of breath while working outdoors. They cannot go outdoors some days. Ms. Thielemann stated these symptoms improve when they are away from the farm.

Carl Thielemann

[341] Mr. Thielemannn testified he and his wife lived together on their farm for many years before the Facility opened. After the Facility opened, he reportedly experienced bitter, chemical smells that at times smelled 'skunky' or like fabric softener, when the wind blows from the southeast: the direction of the Facility. He described the smells having an associated taste. Mr. Thielemann testified that his descriptions may be imperfect, but he was trying to describe the smells in terms familiar to him.

[342] Mr. Thielemann also reported burning sensations, coughing, and hoarseness in the throat, arising regularly after the Facility opened, even weekly. In several of those complaints, the Facility was identified by Metro as a possible or probable source. Mr. Thielemann stated no one ever came to his property from Metro to investigate.

[343] Pictures taken by Mr. Thielemann were entered into evidence. They showed a cloud, fog, or similar, which Mr. Thielemann described as causing the symptoms he had described. He stated this cloud-like substance was heavier than air and descended from the Facility. Mr. Thielemann stated that he sometimes experiences symptoms without the presence of a cloud-like substance, but the burning sensations he experiences are worse when the cloud or fog is present. He stated his symptoms were worse when the Facility was operating but still present when it was not. The symptoms had improved between the early days of the Facility's operations but remained an active concern when he gave his evidence, years later, while the Facility was operating under the 2020 Permit.

[344] Mr. Thielemann stated that he had grown discouraged with the lack of reply or change resulting from his complaints. He stated he no longer filed complaints with Metro as a result.

[345] He added that his family had suffered as a result of the Facility's emissions. His nieces and nephew stopped visiting because emissions triggered an asthma attack in one of his nieces. His wife no longer lived on the farm and her health had worsened as a result of exposure to the Facility's emissions, Mr. Thielemann believed.

Sonja Kroecher

[346] Ms. Kroecher described having been walking in the area near the Facility in April 2018, when she started to feel a headache and started shivering, like she was coming

down with the flu. She related these symptoms to an exposure to emissions from the Facility.

The Appellants' Expert Evidence

Dr. James Bolton

Expertise

[347] In April 2019, the appellants tendered Dr. Bolton as an expert witness in three areas:

applications of ultraviolet technology, including ultraviolet disinfection of water and ultraviolet purification of water and air;

water chemistry and the treatment of pollutants in water; and

environmental aspects of water chemistry.

[348] It became clear to the panel that the appellants were having difficulties in framing their application to have Dr. Bolton certified as an expert witness. After some questions posed of the appellant representative for the purposes of the application, Dr. McFadden, he advised he wished to obtain evidence from Dr. Bolton on the following topics:

1. the identification of toxicants;
2. the environmental impacts of toxicants;
3. the use of technology to reduce emissions; and
4. the creation of expert reports.

[349] Dr. Bolton held a doctorate in physical chemistry from Cambridge University. He had taught chemistry for over 40 years, before he reportedly retired in 1996. Dr. Bolton's teaching experience at universities included laboratory chemistry, environmental chemistry, and emissions treatment using ultraviolet light, ozone, membranes, and oxidation. He had considerable experience with scientific reports and had graded them. He also had experience with photochemistry in environmental applications, the chemical impacts of contaminants, and environmental stewardship through ISO 14001 certification with respect to two industrial facilities, starting primarily in December 2018.

[350] Dr. Bolton testified that he had used the scientific method to evaluate testing methodologies for three to eight years, to assess the effectiveness of environmental controls in specific cases, and to make assessments about the best available technology for environmental purposes. His work on contaminated sites was predominantly with organic contaminants. He had no experience with zinc contamination, galvanizing, air dispersion modelling, depositional analysis, the *Contaminated Sites Regulation* the BCWQGs, or environmental sampling protocols in British Columbia.

[351] With respect to the identification of contaminants and their environmental impacts, Dr. Bolton stated he had experience with the impacts of a variety of chemicals. He had taught university courses in environmental chemistry. He had also published papers on the subject and worked as a consultant in areas involving environmental impacts.

[352] With respect to the use of technology to reduce emissions, Dr. Bolton testified he had considerable experience with environmental controls and the use of BACT. He testified he had taught courses in pollution abatement using ultraviolet light, ozone, membranes, and oxidation. He described teaching advanced pollution abatement courses for seven or eight years, applied to a variety of methodologies, after researching and learning about these systems. These courses were both undergraduate and graduate-level. Dr. Bolton described having dealt with environmental toxicants for most of his life and having advised and consulted on a range of pollution abatement solutions.

[353] With respect to the creation of expert reports, Dr. Bolton described a broad experience in scientific reporting. He graded scientific reports during his long career and had routinely evaluated testing methodology. He stated he had expertise in scientific methodology generally, as this was central to his work as a chemist. He had evaluated scientific methodologies throughout his career.

[354] Additionally, Dr. Bolton stated that scientific sampling was a common thread throughout these areas of expertise. He stated that sampling programs were used to define the scope of a problem using chemistry. He described working on four or five large-scale environmental projects, each taking one to two years, as an expression of his practical experience with environmental sampling.

[355] Dr. Bolton also testified that he had experience in environmental stewardship in industry using international standard ISO 14001. He described serving on a technical committee for a different industrial facility (a rubberizing facility) operating in the area, starting in December 2018. This committee applied ISO 14001 to its emissions. Dr. Bolton had no other experience with that standard or its application, although he described his experience with the standard as intense and immersive.

Positions of the Parties

[356] Counsel for Metro and Ebco both objected to the lack of notice provided by the appellants on the areas in which Dr. Bolton was to testify. The areas of expertise identified in the Notice of Expert Testimony were not the same ones that Dr. Bolton emphasized in the oral hearing.

[357] While counsel for Metro and Ebco both conceded that Dr. Bolton was a distinguished scientist with excellent credentials, they argued that his expertise was not relevant to the appeal. Specifically, Dr. Bolton did not have experience treating zinc and nickel-bearing emissions. The use of ultraviolet light to treat contaminants was not in issue, nor was the treatment of wastewater. Dr. Bolton did not have experience with galvanizing operations.

[358] Furthermore, counsel for Metro and Ebco both argued that Dr. Bolton did not have knowledge about the environmental sampling methodology required in British Columbia, required by the Ministry of the Environment and Climate Change Strategy.

[359] Finally, counsel for Metro and Ebco both argued that Dr. Bolton did not have enough experience to be certified as an expert in industrial environmental stewardship or the application of ISO 14001.

[360] The appellants emphasized Dr. Bolton's long and distinguished teaching history and his work in emissions control and environmental stewardship. They argued that he learns quickly and was an appropriate expert in stewardship, notwithstanding the brief period of exposure he had to the application of ISO 14001. The appellants argued that the other parties knew enough about the appeal that they would be able to manage despite the lack of complete detail in Dr. Bolton's Notice of Expert Testimony.

[361] The appellants emphasized they were laypeople struggling to match the resources available to the other parties. They argued that Dr. Bolton had some history with heavy metals emissions, including their identification and impacts. They also argued that the panel could weigh Dr. Bolton's evidence depending on how impactful his lack of familiarity with British Columbia regulations was to his evidence.

The Panel's Findings

[362] The panel was satisfied that Dr. Bolton was an expert in environmental sampling methodology. Although Dr. Bolton did not have experience with the sampling protocols in British Columbia, the differences between protocols with which he was familiar and those applicable in this jurisdiction could be put to him during his testimony. His lack of familiarity with British Columbia standards did not preclude him from speaking to environmental sampling generally, including designing sampling programs. The panel found Dr. Bolton to be an expert in environmental sampling methodology generally because of his work and long career in academia, though without experience in the methodology that is standard in British Columbia.

[363] The panel was also satisfied that Dr. Bolton had expertise in the scientific method, methodological evaluation, and reporting. His long career involved many years of assessing scientific work and teaching the application of methodologies using the scientific method.

[364] The panel was not satisfied that Dr. Bolton had relevant expertise in toxicant identification, environmental impacts of contaminants, or environmental controls. The questions posed indicated that Dr. Bolton focused on organic contaminants during his career, and on the treatment of effluent streams using a variety of treatment methods that were not applicable to the appeal. While it is possible that Dr. Bolton had some experience with contaminants and contaminant treatment methods that had some relevance to this appeal, insufficient detail was presented in certifying Dr. Bolton to establish this fact. The panel could not infer, based on some experience with the

treatment of lead from emissions, that Dr. Bolton had expertise in the treatment of zinc, nickel, or other contaminants of concern in these appeals.

[365] The panel was not satisfied that Dr. Bolton had relevant expertise in environmental stewardship. Dr. Bolton's professed expertise related to his involvement with a company engaging in environmental stewardship, using ISO 14001. He had not taken courses in this area and his experience was limited to one case. Even if that case was intense and immersive, this was an insufficient basis to conclude that Dr. Bolton would have a sufficient breadth of knowledge in the area to reliably apply knowledge gained in one context to another.

[366] With respect to the lack of notice, counsel for Metro and Ebco both expressed willingness to proceed with the testimony of Dr. Bolton, although counsel for Metro stated that notice requirements exist for a reason and the parties should have had proper notice of Dr. Bolton's impending testimony. The panel assured these parties that if they needed more time to adequately prepare for Dr. Bolton's testimony, they could have it. Neither Metro nor Ebco sought additional time to prepare.

Evidence

[367] Dr. Bolton assessed the methodology associated with the April 2019 SPW Report and opined that it did not conform to sound scientific principles.

[368] First, Dr. Bolton was critical that single samples were taken at each sampling location, as three to five samples at each sampling location was the standard and would allow meaningful statistical assessment. He stated that this was the case regardless of whether Envirochem's sampling methodology conformed to standards from British Columbia's Ministry of the Environment.

[369] Second, Dr. Bolton criticized the Envirochem report for averaging sample results from the Background Location with sampling from other locations downwind from the Facility. Dr. Bolton stated this was improper methodology.

[370] Third, Dr. Bolton stated that the April 2019 SPW Report failed to provide necessary error reporting on the analytical techniques used in sampling. Dr. Bolton stated that information describing measurement errors should have been included as an appendix to the report.

[371] Overall, Dr. Bolton stated that the April 2019 SPW Report was deeply flawed, such that it should not be relied upon. He added that the delay between the start of operations at the Facility and sampling for the SPW Reports was problematic because it did not establish a pre-emissions condition. Dr. Bolton stated the April 2019 SPW Report was also flawed because of the sampling methodology: it lacked necessary field blank samples (control samples) and involved the collection of one sample at each sampling location, as opposed to three or more.

[372] Additionally, Dr. Bolton testified that the 2019 Permit and associated sampling programs were inadequate to determine the Facility's emissions. Given that it operates as

a batch galvanizer, Dr. Bolton stated sampling needs to be done at all hours, randomly, over a month to correlate emissions with activities at the Facility. Dr. Bolton also stated that mass balancing was necessary to determine the amount of material emitted from the Facility.

[373] In cross-examination, Dr. Bolton confirmed he had never worked on an air emissions permit, had not seen the Lanfranco stack test reports measuring emissions from the Facility, had not seen assay results that described the concentrations of compounds involved in Galvanizing, and had no knowledge of the dross generated as a byproduct of Galvanizing. Furthermore, Dr. Bolton agreed that any mass balancing exercise would need to account for the steel's pre-treatment and Galvanizing, including drips, spills, and evaporation at every step of the process. Dross would need to be analysed as well. Dr. Bolton agreed that this would involve measurements at every step of the process, complete with error analyses, followed for all the different types of Galvanizing done at the Facility.

Jim Armstrong

Expertise

Examination on Expertise

[374] The appellants tendered Mr. Armstrong as an expert witness to provide an opinion on how emissions authorized under the 2018 Permit would affect the appellants' farms, aquaculture, horse boarding, and crops. He holds bachelor's degrees in biology and chemistry and a Master's degree in environmental science and management, with an emphasis on marine biology and environmental chemistry. Mr. Armstrong worked as a regulator for 32 years, for Metro and for British Columbia's Ministry of the Environment.

[375] While working at Metro, Mr. Armstrong drafted emissions permits for consideration by district directors. He designed, managed, and monitored sampling programs for surface water, underwater sediment, soil, and fish health. He dealt with monitoring equipment. He had studied impacts associated with fisheries contamination for decades. In the private sector, he designed air emissions systems and secured air emissions permits for various industries, including metal plating facilities. He had been an enforcement officer, charged with the enforcement of permits in various locales, including in the City of Surrey.

[376] Mr. Armstrong acknowledged limits on his expertise. He was not a hydrologist or a soils engineer. He had some knowledge about rapid infiltration of contaminants into ecosystems through soils but would defer to others more educated and experienced in this area.

Examination on Impartiality

[377] Mr. Armstrong joined the NES in or around 2012 and served as a director from 2016 or 2017. At the time of the hearing for these appeals in 2022, he was president of the

NES. He described his activities as non-political and were focused on salmon enhancement, fund raising, and working toward the restoration and enhancement of local watersheds through participation in the Fraser Valley Watershed Coalition.

[378] Mr. Armstrong considered that he could offer an impartial opinion. He was bound by a code of professional ethics to advance science-based opinions and to not take positions advocated by parties. His professional obligations required him to offer pro bono services, and he fulfilled that requirement through his work with the NES. He emphasized that his professional work mostly came from businesses and he strived to maintain a reputation for impartiality.

[379] Mr. Armstrong addressed his prior involvement with the Facility. He became a director of the NES while the Approval was under appeal to the Board. As a director, he made submissions on behalf of NES during those appeals, including with respect to the stay application. The NES' submissions argued that certain environmental impacts would result from the Facility's operations. Mr. Armstrong stated he was advancing the position of the NES in the context of that appeal, not necessarily his own views.

[380] Later, Mr. Armstrong provided information on behalf of the NES to the District Director when engaging with Metro before the 2018 Permit was issued. He wanted to ensure the District Director had all appropriate information before making his decision on the Permit. Specifically, Mr. Armstrong noted he had provided information related to impacts to trout raised on IronGait, but he would not be addressing that information in his testimony, instead focusing on potential impacts to salmon in Erickson Creek. He conceded that these were similar analyses and resulted in similar recommendations, but stated he saw them as different issues.

[381] Mr. Armstrong also initially appeared as the NES' representative in these appeals. He had received correspondence related to the appeals because the person who would normally have done so was unavailable for family reasons. He agreed, in hindsight, it would have been better for someone else to fulfill those roles.

[382] Mr. Armstrong testified that, at the time he was to testify, he was a non-voting member of the NES' board of directors and had not been part of decision-making on positions to take for these appeals. As president, he would only vote in the case of a tie and was obligated to vote in the negative on any resolution.

[383] Counsel for Ebco questioned Mr. Armstrong's conclusion, given in his Notice of Expert Testimony, there was a risk of "serious harm" to Erickson Creek and the Little Campbell River. Mr. Armstrong stated this was not a subjective term, but rather was defined in the *Fisheries Act*.[8] He stated he used the term in that context. He also stated his analysis relied on peer-reviewed articles, evidencing his impartiality in addressing the questions put to him as a possible expert witness.

[8] R.S.C. 1985, c. F-14.

[384] Ebco put to Mr. Armstrong that he has also worked on a judicial review related to the Facility. Mr. Armstrong agreed he had, but stated the judicial review related to land use and appropriations. He considers that a different matter.

[385] Mr. Armstong stated that he understood his duty as an expert would not be to advance the position of any party, but rather would be to assist the Board on matters within his expertise.

Positions of the Parties

The Appellants

[386] The appellants argue that Mr. Armstrong should be certified as an expert witness in respect of the impacts the Facility's emissions authorized under the 2018 Permit will have on their agriculture, their aquaculture, and the health of animals.

[387] The appellants submit that Mr. Armstrong's involvement with issues related to the Facility stem from him volunteering in his community, which the Board should not hold against him. The appellants argue there is no dispute that Mr. Armstrong has valuable expertise that could benefit the Board and has showed the ability to differentiate between that role and his role as an expert. Furthermore, his analysis is grounded in well-explained and documented sources that help to establish its impartiality. The appellants argued they have no alternative expert available.

Metro

[388] Metro argued that the issue was not personal integrity, it is whether the Board can distinguish Mr. Armstrong's beliefs as expressed from his objective opinion. Metro says the Board cannot, as the two have been intermingled. The Board needs to be able to rely on an objective, unbiased, arms-length expert, which Mr. Armstrong is not. The Board's process must safeguard against advocates disguised as experts.

[389] Metro says Mr. Armstrong should not be qualified as an expert witness but, if he is, these concerns should go to the weight afforded his testimony.

Ebco

[390] Ebco took issue with Mr. Armstrong's impartiality, not his expertise. Ebco argues Mr. Armstrong cannot be impartial because of his role as president of the NES and because he has acted in legal and quasi-legal processes against Ebco and the Facility specifically.

[391] Ebco urged the panel to consider the precedent set by allowing an advocate to present as an expert witness. This would fall short of the standard for expert witnesses applied by the courts.

[392] Ebco referenced several cases in support of its position:

- *Jack and Linda Chisholm v. Assistant Water Manager*, 2018 BCEAB 12 (CanLII) (*Chisholm*), in which the Board refused to certify a proposed expert who had

represented a party over several years and made submissions as part of that appeal;

- *Handley v. Punnett*, 2003 BCSC 294 (CanLII) (*Handley*), in which the Court refused to certify an expert witness for a number of reasons, including that he was a party to the proceeding and the Court considered it unlikely he could project an objective opinion for that reason or, alternatively, if he could the Court considered that virtually no weight should be given to his evidence;
- *Royal Trust Corp. of Canada v. Fisherman*, 2000 CanLII 22384 (ON SC) (*Royal Trust*), in which a court refused to certify a lawyer as an expert witness where that lawyer continued to act for a party to the proceeding in other matters; and
- White Burgess Langille Inman v. Abbot and Haliburton Co., 2015 SCC 23 (CanLII) (White Burgess), discussed in more detail below.

Panel's Findings

[393] After considering the authorities provided by Ebco, the panel found *White Burgess* most persuasive. At paragraph 50 in *White Burgess*, the Court stated:

> When looking at an expert's interest or relationship with a party, the question is not whether a reasonable observer would think that the expert is not independent. The question is whether the relationship or interest results in the expert being unable or unwilling to carry out his or her primary duty to the court, to provide fair, non-partisan and objective assistance.

[394] Mr. Armstrong was asked many questions about his involvement with the NES and the other appellants in this case. He was asked about his history of commentary with respect to the Facility. The panel recognizes the concerns expressed, primarily by Ebco, that Mr. Armstrong had acted as a representative of the NES in previous proceedings and during pre-hearing matters in the context of these appeals.

[395] The details of Mr. Armstrong's involvement in these appeals is crucial. He provided information or documents on three occasions to the Board during the life of these appeals:

- on April 23, 2018, he submitted a notice of appeal on behalf of the NES;
- on January 3, 2019, he wrote to the Board to ask that a document be re-sent to the NES; and
- on May 7, 2019, he communicated to the Board to advise he was no longer representing the NES.

[396] It is important to note that, by the time Mr. Armstrong was to provide evidence, he was no longer acting as a representative to the NES. Furthermore, he did not make submissions beyond asserting the NES' position in its notice of appeal. He did not make

submissions after hearing any evidence. This is an important distinction between this case on one hand and *Chisholm*, *Handley*, and *Royal Trust* on the other. Mr. Armstrong was not himself a party in any proceedings involving the Facility and stopped acting as a representative of any party before providing any evidence or submissions in these appeals. Insufficient evidence was presented to show that he continued to act on behalf of the NES as an expert in other matters and he says he did not participate in discussions or votes to set the NES' position with respect to these appeals.

[397] The panel recognizes that the circumstances of this case led very closely to Mr. Armstrong being ineligible to serve as an expert witness in these appeals, but the factors above support his certification. Furthermore, he demonstrated the ability to distinguish his historical role as a representative of the NES and as a voting member of the board on one hand to his role as an expert witness on the other. He understood the difficulty his previous roles placed on him serving as an expert in these appeals but articulated a clear willingness and ability to adhere to the requirements of an expert witness.

[398] The panel certified Mr. Armstrong as requested by the appellants but committed to scrutinize the evidence he was to provide. The understandable concerns of Ebco and Metro would go to the weight of the evidence Mr. Armstrong was to provide.

Evidence

[399] Mr. Armstrong testified that emissions from the Facility could, depending on deposition rates into Erickson Creek, negatively impact salmonid habitat there. He explained the risks of acute and chronic zinc exposure to fish in the headwaters of Twin Creeks, the Little Campbell River, and the trout pond on IronGait's lands. Furthermore, Mr. Armstrong stated that the deposition of particulate from the Facility's emissions on land could significantly affect humans and livestock (cattle and horses specifically).

[400] Mr. Armstrong considered long-term, comprehensive environmental monitoring to be required. He considered some level of impact from the Facility's emissions to be likely, depending on deposition rates. Mr. Armstrong stated the maximum recommended zinc concentration would depend on the specifics of the water system, including the presence of other substances that may interact with zinc.

[401] Mr. Armstrong stated that environmental monitoring of water systems near the Facility should have started with a background study to assess other sources of the possible contaminants of concern, the presence of other substances that interact with those possible contaminants, and anticipated impacts to fish, other biota, and plants. Monitoring for impacts to fish populations takes three to five years, as all phases of the fish's life should be assessed.

[402] Mr. Armstrong recommended a technical committee, comprised of expert witnesses called by the appellants and representatives from Ebco, be formed to review the Permit, determine the actual emissions, and design a monitoring study "that reflects the chemical balance of all chemicals [and] metals that are in use" in the Facility.

[403] Mr. Armstrong stated he did not review the BCWQGs in support of his opinion, nor did he compare surface water measurements from around the Facility with the information he reviewed. The only water quality samples Mr. Armstrong reviewed were from samples taken from Mr. Mueggenberg's trout ponds in April 2016. He declined to comment about soil quality, water quality, or fish health in the particular circumstances of Ebco's reported emissions, as he had not reviewed the relevant information. He also declined to consider emissions permitting, saying he did not have enough experience in the area to provide an expert opinion. Mr. Armstrong also declined to comment on stormwater management in this case, the impacts of other metals, and the impacts of acid to the local water systems as this was beyond the scope of his Notice of Expert Testimony.

Klaus Oehr

Expertise

Examination on Expertise

[404] The appellants called Mr. Oehr, a chemical engineer, as an expert witness in that field. He had, at the request of the appellants, assessed the cause and environmental impacts of nickel and zinc contamination he said was occurring at SL1A and SL2.

[405] Mr. Oehr worked for many years in electrochemistry, electrochemical engineering, and applied industrial chemistry. His work included work with zinc and Pickling using hydrochloric acid. He worked with various emissions control systems over his decades of work experience. He also assessed lead contamination levels in soils.

[406] Mr. Oehr explained that he also had taken an undergraduate course in statistics and had been trained by a statistician in the use of curve-fitting software used for research and development applications. He had used this software over 15 to 20 years and felt he had developed expertise in the last five to ten years. He did not have any certification in its use, however. Mr. Oehr used his understanding of statistics and engineering to apply the results of the curve-fitting program to resolve technical problems. Mr. Oehr did not have any training in air dispersion modelling, atmospheric sciences, or toxicology.

[407] Mr. Oehr had previously sent a letter of concern to Mr. Robb about the Facility, describing what he considered to be massive exceedances of ambient air quality objectives should the Facility be allowed to operate. Taken through his analysis under cross-examination, Mr. Oehr conceded that he based that conclusion on the faulty assumption that the concentration of air contaminants measured in stack testing would be the same as the concentration of those contaminants in the environment overall.

Positions of the Parties

The Appellants

[408] The appellants say that Mr. Oehr's expertise will allow him to assess the byproducts the Facility may be emitting, which may have impacts on human health and the environment. The appellants say that Mr. Oehr does not need expertise in toxicology, as regulatory standards are made to establish thresholds for potential impacts to human health and the environment. Furthermore, they say that Mr. Oehr does not need expertise in air dispersion because his analyses appropriately use the assumptions and calculations from the Air Dispersion Model Report. They say Mr. Oehr has the necessary expertise in statistics to use curve-fitting software to analyse the deposition and accumulation of nickel and zinc at SL1A and SL2.

[409] The appellants add that they are unsure one expert could touch on all areas of expertise Ebco noted Mr. Oehr lacked, as discussed below: air dispersion, toxicology, medicine, human health, meteorology, atmospheric sciences, risk assessment, BACT, environmental fate, the update of metals in plants or animals, and environmental assessment. In any event, the appellants say they could not afford to retain such a person. They ask that the Board certify Mr. Oehr as an expert in metallurgical chemistry, statistical analysis applied to air dispersion, emission control, and the environmental fate of contaminants in air and soil.

[410] With respect to any concerns around impartiality, the appellants argue that Mr. Oehr attended a public meeting on the Facility and wrote about concerns he had, but he did not engage in advocacy.

Metro

[411] Metro stated that there was no notice in Mr. Oehr's report or *curriculum vitae* that he would seek to provide opinions on emissions control, including emissions reductions, galvanizing, Pickling, plant design, industrial processes, air dispersion modelling, or BACT. Metro says it would be unfair for the Board to certify him as an expert in those areas and disputes that Mr. Oehr has the requisite levels of expertise in those areas.

[412] Metro says that Mr. Oehr has insufficient formal training to be considered an expert in statistics: he simply had training from a colleague and learned to use specific computer software. Metro says that Mr. Oehr does not have training or expertise in the environmental fate of contaminants or environmental toxicology. His analysis, where referencing those areas of study, is out of scope.

[413] Metro concedes that Mr. Oehr has expertise in specific areas of chemistry, but not with chemical processes in air or the environmental fate of contaminants in air and soil. Metro says Mr. Oehr does not have training in aerosol chemistry, meteorology, or other fields of study required to provide expert opinions on chemical reactions in the environment, as opposed to within controlled environments.

[414] Metro is also concerned that Mr. Oehr is not objective as he has spoken publicly about the Facility and the shortcomings he perceives it to have. In doing so, Mr. Oehr misleadingly or ignorantly conflated the concentration of contaminants in stack tests with the concentration of contaminants in the environment, calling into question his suitability to serve as an expert witness in these appeals.

Ebco

[415] Ebco references *Mohan*, which states that expert evidence must be treated with caution and should only be considered where it is relevant, necessary, from a properly qualified expert, reliable, and not otherwise excluded by the rules of evidence.

[416] Ebco says that Mr. Oehr is not an expert in many of the areas in which he was put forward: air dispersion, toxicology, medicine, human health, meteorology, atmospheric sciences, risk assessment, BACT, environmental fate, the uptake of metals in plants or animals, or environmental assessment. While Mr. Oehr has expertise in some areas of chemistry, he had no particular expertise in galvanizing. He referred once to Pickling with hydrochloric acid, but not to any processes undertaken in the Facility. With respect to statistics, Ebco says that Mr. Oehr does not have sufficient training in statistics to be qualified as an expert in that area.

[417] Ebco also stated that several of the areas of proposed expertise are not mentioned in Mr. Oehr's report. Allowing him to testify to those areas would deny Metro and Ebco the notice required under the Board's rules of such evidence. Furthermore, Ebco says it cannot cross-examine Mr. Oehr on areas other than those for which the Board certifies him as an expert and it would be unfair to require Ebco to tease apart all those areas of inappropriate comment from areas in which Mr. Oehr may offer a valid, if objectionable, opinion.

[418] Ebco argues that there was not enough notice given to allow it to prepare for the curve-fitting software used by Mr. Oehr.

[419] Ebco argues that Mr. Oehr's earlier submissions to Mr. Robb amount to advocacy, calling into question Mr. Oehr's impartiality. Further, Ebco says Mr. Oehr's letter to Mr. Robb highlights faulty assumptions he made and continues to make. This letter shows fundamental misunderstandings about the capture efficiency of baghouses, air dispersion, and what PM2.5 means. Ebco says there is no basis to compare the data presented by Mr. Oehr with the data presented in the 2017 Hemmera Report and the 2020 Hemmera Report. Ebco further queries the scholarly sources read by Mr. Oehr and referenced in his report, saying those studies are not likely applicable to the issues in these appeals.

[420] Ebco argues that Mr. Oehr's opinions are hidden beneath a scientific veneer but are not reliable. There is no evidence about the robustness of the curve fits provided by the software he uses. There is no statistical discussion to ground the coefficients given as outputs from the software, as to whether they are statistically significant to an input data

set. Ebco says that Mr. Oehr was using software he did not understand. Ebco says Mr. Oehr's computer analysis is rife with errors and it should not have to address those in cross-examination.

[421] Furthermore, Ebco says Mr. Oehr's report uses alarmist language, referencing toxic chemicals without having the expertise or contextualizing the information he discusses. Ebco adds that Mr. Oehr's report discusses appeal rights and—although he was proffered as an expert witness only in the context of appeals of the 2020 Permit—discusses sulphuric acid, which falls properly under the appeals of the 2018 Permit.

The Appellants' Reply

[422] The appellants say that Mr. Oehr's statistics training was sufficient for him to provide his opinion. They say that portions of Mr. Oehr's report for which the District Director and Ebco did not have notice can be removed. Additionally, while Mr. Oher may not have expertise in BACT, his experience with production and the manufacture of industrial equipment could be valuable to the Board. They argue that his accomplishments establish he is a genius who has engaged in experimental design and has practical experience that could assist the Board.

[423] The appellants emphasize they do not have the resources available to Metro and Ebco and the appeal process should account for this. They argue that, to the extent any errors were made in Mr. Oehr's 2017 letter to Mr. Robb, it was not an expert report and did not have the safeguards that would be in place in evidence Mr. Oehr provided to the Board. Additionally, with the passage of time between 2017 and when Mr. Oehr was called as a witness, 2022, he gained in experience and knowledge. The other parties will be able to cross-examine Mr. Oehr on his analysis in the hearing and the Board will be able to assess the reliability of his conclusions.

[424] The appellants add that the computer modelling done by Hemmera is not reality, whereas Mr. Oehr's evidence relates to real measurements. They argue this makes his evidence a valuable alternative to the analysis provided by Hemmera.

The Panel's Findings

[425] The panel certified Mr. Oehr as an expert in chemical engineering.

[426] While recognizing problems with Mr. Oehr's 2017 letter to Mr. Robb and that Mr. Oehr was present at a public meeting about the Facility, these are insufficient to establish that Mr. Oehr was engaged in advocacy. Mr. Oehr wrote about his concern with the Facility in 2017 but was not acting in the role of an expert at that time and did not continue to make statements or arguments against the Facility. The panel considers that Mr. Oehr's comments to Mr. Robb should appropriately be considered when the panel decides the weight to give Mr. Oehr's evidence, as described in *White Burgess*, rather than to affect the admissibility of that evidence. Mr. Oehr has expressed he understands what his role as an expert would be in these appeals if he were certified as one.

[427] Furthermore, any concerns about Mr. Oehr's understanding of emissions treatment, air dispersion, the nature of PM2.5, or other foundational questions can be canvassed in cross-examination. After considering the cross-examination on Mr. Oehr's expertise, the panel is satisfied that he understands these concepts to the degree sufficient to provide opinion evidence on chemical engineering and any confusion or misunderstandings highlighted in cross-examination will go to the weight the panel gives his testimony.

[428] The panel expects that any exaggeration or imprecision in Mr. Oehr's report will likewise be canvassed in cross-examination and the panel could effectively deal with such issues by appropriately weighing Mr. Oehr's evidence.

[429] The panel also recognizes that Mr. Oehr's report strayed beyond the bounds of his areas of proposed expertise but considers the portions for which the Board cannot accept his opinion can be excised from the rest. As such, the panel emphasized it would only consider Mr. Oehr's report where referenced in testimony, guarding against the intermingling of admissible opinion evidence from inadmissible opinion evidence. Mr. Oehr would not be allowed to reference scholarly articles beyond the scope of his accepted expertise.

[430] With respect to the conflict in expertise between chemical engineering and air dispersion modelling to address the same question, the panel did not wish to prejudge whether only one discipline could be used to address the relevant issues. The panel wished to consider the matter from both perspectives and would determine which satisfied the requirements of expert evidence from *Mohan* and, if both did, weigh the evidence appropriately: determining whether seemingly different opinions could be reconciled and, if not, which was more persuasive.

Evidence

[431] Mr. Oehr began his analysis using the results from the SPW Reports available to him (those written from 2019 to 2021). He considered Envirochem to be a reliable consultant based on his experience and was willing to base his opinion on their analyses.

[432] Mr. Oehr looked at three sets of soil sampling data from SL1A and SL2, using the average from each sampling event where possible, and used curve-fitting software to calculate the average rate of increase in nickel and zinc based on the sampling results inputted into the software. Mr. Oehr calculated these rates of increase for nickel to be 20 mg/day at SL1A and 17.6 mg/day at SL2. The calculated rates for zinc were 42 mg/day at SL1A and 35 mg/day at SL2. Mr. Oehr noted these rates of increase at the different sampling locations were similar for each metal. Furthermore, he calculated strong coefficients of correlation. While perfect correlation has a coefficient of 1.0, he calculated a coefficient of correlation for zinc at 1A equal to 0.94, for nickel at 1A equal to 0.986, and for zinc at SL2 equal to 0.81. No coefficient of correlation was provided for nickel at SL2.

[433] In cross-examination, Mr. Oehr stated that some measures considered in his analysis included possible outliers, but he considered it best to use the averages from each sampling event as the best available data. In cross-examination, Ebco explored Mr. Oehr's understanding of related statistics. While he understood standard deviation to represent variability within a data set, he did not know how standard deviation equated to the proportion of data points in a set that appear within a certain range from the average.

[434] Using the rates of accumulated nickel and zinc that he calculated for SL1A, Mr. Oehr compared the projected accumulation described in the 2017 Hemmera Report. He concluded that Hemmera had under-estimated zinc deposition by a factor of up to 74 times.

[435] During the hearing, the sampling results for the 2022 SPW Report were made available to Mr. Oehr. He revised his calculated rates of nickel and zinc accumulation at SL1A based on this data and reduced the rate of increase by roughly 50% as a result. Mr. Oehr maintained that this rate was inconsistent with Hemmera's results and suggested the air dispersion model may be invalid as a result.

[436] Mr. Oehr then calculated a ratio using the rate of accumulation of nickel and zinc and the maximum ambient air concentration of nickel and zinc, both as predicted in the 2017 Hemmera Report. He applied that ratio to the rate of nickel and zinc accumulation he had projected to predict a maximum ambient air concentration for nickel and zinc in the area around the Facility. He stated his predicted concentrations would exceed Texas' ambient air quality objectives for nickel and zinc. He recognized that he was relying on Hemmera's model for this analysis, treating it as a "black box," but described this as a "flag:" a cause for concern about Hemmera's analysis. He stated he had no alternative available to correlate soil sample results with the projected impacts of the Facility on air quality.

[437] On the question of causation, Mr. Oehr stated that the similarity in calculated accumulation rates for nickel and zinc suggested that they likely came from the same source. Mr. Oehr stated that even sampling at the Background Location revealed increases in both metals and stated that increase could also likely be attributed to the Facility. The only local source he was aware of for both metals was the Facility, although Mr. Oehr conceded in cross-examination that there were other potential sources of zinc in the area, including fertilizer.

[438] Mr. Oehr also stated that pH measurements in the soil samples gathered by Envirochem were lowest at SL1A and SL2. This suggested acidification of the soil by sulphuric acid or hydrochloric acid. Mr. Oehr conceded however that this could relate to other acids as well.

[439] During the hearing, Envirochem's sampling results from July 2022 became available to Mr. Oehr. He considered this data in cross-examination, as well as data points he had omitted or misplotted in his curve-fitting software. Mr. Oehr re-ran the analysis and stated

that it was not clear if zinc concentrations were increasing at all at SL2. Given seasonal variability, Mr. Oehr stated more data was needed.

[440] In cross-examination, Mr. Oehr also acknowledged that Mr. Choi considered the increase in nickel and zinc concentrations at SL1A to be attributable to runoff from the Site. Mr. Oehr stated, however, that the ratio of nickel to zinc indicated by the increase in those results was not in keeping with runoff. He considered another source of nickel to be required to explain the soil sampling results.

[441] Having assessed the cause of the nickel and zinc accumulations around the Facility, Mr. Oehr used raw data from the October 2020 Stack Test, measuring emissions from ES01C, to calculate projected increases in rates of deposition of cadmium and lead at SL1A and SL2. He did so by calculating the ratio of both cadmium and lead measured in the October 2020 Stack Test against the amount of nickel measured. He applied that ratio to his calculated rate of increase of nickel at SL1A and SL2, to derive a rate of increase for cadmium and lead.

[442] In cross-examination, Mr. Oehr conceded that he should not have used the raw measurements from October 2020 Stack Test but should have subtracted the concentrations noted in blank samples to isolate the contribution from the Facility in the stack test results. He agreed that doing so would have made some difference to his results and, given the low concentrations reported in the stack test results, small shifts in concentration could significantly impact his calculations.

[443] It was also put to him in cross-examination that Ebco did not consider the October 2020 Stack Test to have measured its standard operations. When questioned why he did not use the results of the November 2020 Stack Test or the 2022 Stack Test. Mr. Oehr replied that he "got what he was looking for:" an issue to flag, so he did not look further. Mr. Oehr stated that, regardless, even using the numbers from the November 2020 report, results would be problematically high, if all metals emitted from ES01 behave in the same way in the environment.

[444] Mr. Oehr conducted a similar analysis for ammonia but noted that this assumed that ammonia would behave similarly to a metal when emitted into the environment. He was uncertain how good an assumption that was but stated that the resulting increase in predicted ammonia was another "flag."

[445] Counsel for Ebco also asked Mr. Oehr chemical engineering questions related to the Facility's operations. Mr. Oehr stated he would not expect any sulphuric acid to evaporate from an aqueous solution, but agreed it may mist, along with anything soluble from the solution, when a chemical reaction in the solution generates gas. This would occur, for example, when steel is pickled. Mr. Oehr agreed that if Pickling were not underway, misting would only occur if the Pickling Solution was reacting with the tank itself or something reactive (like steel) had been left in the tank.

[446] Mr. Oehr also agreed that hydrogen chloride would also generally be a byproduct of Galvanizing and leave the Facility either through ES01 or as a fugitive emission. It would generally only be created during Galvanizing or if Flux residue remained in the Kettle, decomposing over time, after Galvanizing was complete.

Dr. Bruce Lanphear

Qualification as an Expert

[447] Dr. Lanphear, a physician and research clinician with BC Children's Hospital, was called as an expert witness by the appellants. Dr. Lanphear had worked in public health and preventative medicine. He had studied the effects of contaminants, including lead, on the development of children for over 20 years. He had worked as a university professor, primarily teaching public and environmental health, and had authored more than 150 articles on his area of specialization in medicine.

[448] In cross-examination on his areas of expertise, Dr. Lanphear conceded he was not an expert in the impacts of nickel and zinc on human health. He was familiar with the major components classified as PM2.5, mostly related to traffic and urban environments, but also as generated by industry, combustion, and tobacco smoke. He had worked on PM2.5 for five to ten years but mostly focused on health impacts from lead. Dr. Lanphear had worked on a study in Metro on nitrous oxides.

[449] The panel certified Dr. Lanphear as an expert in public health medicine, including with broad experience in particulate matter, but without expertise related to nickel and zinc specifically.

Evidence

[450] Dr. Lanphear testified that various chemicals and contaminants, including lead and airborne particles, can be toxic and hazardous at even the lowest levels of exposure. Dr. Lanphear discussed, in detail, the impacts of toxic exposure on fetuses, infants, and children, which include myriad health impacts.

[451] Dr. Lanphear noted that regulators often assume a safe level of exposure for contaminants, but increasing durations of even modest exposure can lead to health effects. Dr. Lanphear says that these risks are best managed with the precautionary principle and says that society would be better served preventing the negative health incomes associated with toxic exposure than with controlling the resulting symptoms.

[452] Dr. Lanphear added that emissions from the Facility comprising particulate above PM2.5 should be eliminated entirely, but there is evidence of harm from particulate below the PM2.5 threshold as well. He added that while there is an exposure limit defined for PM2.5 as a catch-all, lower limits depending on the composition of PM2.5 may be appropriate. Dr. Lanphear understood there was a balancing between the economy and public health in authorizing emissions but thought a regulator should know what is being emitted and what is being received in the environment to make the best decision.

[453] Dr. Lanphear confirmed he did not review information about the Facility specifically, including material assays, Stack Tests, SPW Reports, air dispersion modelling, or background concentrations of particulate near the Site. He conceded that nickel and zinc were not materials that have no safe level of exposure but warned they could be problematic at some concentrations. Dr. Lanphear considered particulate to be unsafe at any level and stated the best course was to minimize public exposure to it.

[454] Dr. Lanphear noted that, from his prior experience, galvanizing facilities often used materials with up to three percent lead content. When asked if he would be surprised to learn that Ebco used materials with lead concentrations in or around 0.002%, Dr. Lanphear answered that he "would expect industries to be moving to that."

Metro's Lay Witnesses

Dr. Katherine Preston

[455] Dr. Preston described her educational and vocational experience in the hearing. As she was not tendered as an expert witness, a brief summary only is provided: Dr. Preston holds an undergraduate degree in engineering chemistry and has completed doctoral and post-doctoral studies in atmospheric chemistry. Dr. Preston has worked in air quality consulting, including dispersion modelling, for over 25 years. During that time, she worked on hundreds of air dispersion modelling projects.

Emissions Assessment by Metro

[456] Dr. Preston was asked about any conflict of interest on the part of Hemmera. She acknowledged that Hemmera in this case was paid for its work by Ebco but stated that she was not concerned about a conflict of interest. Hemmera does a lot of air dispersion monitoring work for a variety of clients and their reputation is important. Furthermore, they are subject to professional responsibility rules that address this sort of concern.

[457] Dr. Preston was asked about the use of mass balancing in emissions regulation. She stated that mass balancing does not provide information on where emissions end up in the environment or in what quantity. She said that mass balancing does not provide information on the environmental fate of emissions, but is typically used to check whether emissions requested to be authorized in an air emissions permit make sense. She described mass balancing as a rough tool in the context of emissions treated with baghouses because of the difference between the tonnage of material and product weights, and the small weights of emissions, can only be determined after weighing differences in baghouse filters and all material cleaned out from the baghouses.

Emissions Management and Monitoring Under the Permit

[458] Dr. Preston was asked about design features in the Facility that could reduce or eliminate fugitive emissions and responded that she understood certain measures cannot

be operationally managed. Dr. Preston added that she cannot mandate operational requirements, merely the release of air contaminants into the environment.

[459] Dr. Preston also stated that continuous monitoring would cost, over its lifespan, roughly $50,000 to $100,000 per emissions source. These sorts of monitoring systems are required for less than one-third of Metro's permits and are required of the top three emitters. Dr. Preston did not consider such a system necessary for the Facility, as it generally operates well below the limits set in the Permit and is near the bottom of the list of emitters, in terms of tonnage of air contaminants.

[460] Dr. Preston was also asked why the 2020 Permit does not mandate simultaneous stack testing of ES01A, ES01B, and ES01C. Dr. Preston believed that this was done at Ebco's request, but she was unsure what the justification was. Regardless, in her review she did not see any problem with that. She also did not see any problem with testing each of those sources every two years instead of more frequently, and said it was consistent with other permit requirements, based on the size of the Facility and its compliance history.

Robert Kemp

[461] Mr. Kemp was, at all times relevant to these appeals, a professional engineer with the title Senior Project Engineer at Metro. He retired, left work, and abandoned his professional engineering accreditation in 2021.

[462] The appellants took Mr. Kemp through pictures of the Facility and asked him to compare the state of the Secondary Containments when he visited in June 2020 as part of his consideration of the proposed Permit amendment. Mr. Kemp noted there were possible changes to the Secondary Containments based on pictures that he was informed were taken subsequently.

Ray Robb

[463] Mr. Robb's background includes extensive work as a chemist in a galvanizing facility and in environmental remediation and management, including many years of experience in issuing air emissions permits and enforcing and prosecuting permit terms.

Air Emissions Enforcement and Silver City

[464] Mr. Robb described the typical path of achieving compliance from a noncompliant emitter of contaminants: generally, they advise the operator of the noncompliance and ask for steps to address the issue, but may issue pollution abatement orders, tickets, or use similar means to deter the unauthorized emissions, and may pursue prosecution as a last resort, due to the expense involved in prosecuting and the high standards of proof. Mr. Robb stated that, in some circumstances, Metro may skip one or more of the steps described above in addressing unauthorized emissions from an operator within Metro.

[465] Mr. Robb also described Metro's prosecution of the Silver City Facility in and around 2012. Mr. Robb noted many public complaints about that facility, which he described as

having no permit at the time and few, if any, emission control works. Mr. Robb stated that emissions from the Silver City Facility were significantly more severe than the Facility's emissions and those emissions were corroborated by Metro staff.

[466] After a settlement agreement was reached with Silver City, Metro issued a permit to that company. That permit authorized the Silver City Facility to emit ten times the threshold limit value of sulphuric acid from the AAQOs, whereas the Permit authorizes the Facility to emit 25% of that limit value. In fact, measured sulphuric acid concentrations in emissions from Silver City's facility in 2022 and 2023 were greater than Ebco's permitted sulphuric acid emissions levels (0.1 to 0.53 mg/m^3 according to Silver City's annual reports from 2020 to 2022).

[467] Mr. Robb was asked why the Facility was not being monitored more closely. He responded that Metro has spent more time on the Facility relative to its permit fees (which Metro uses as a measure of the risk it poses to human health and the environment) than any other facility currently active or in the previous 10 years. To measure what is being emitted from the Facility and to track its movement, Metro would need to establish a multi-dimensional grid of air sampling stations and would need to spend millions of dollars. This intensity of investigation is not even done for a facility in Metro that emits thousands of times more air contaminants than the Facility does. It would not be an efficient use of Metro's resources.

Potential Terms Not Included in the Permit

[468] Mr. Robb discussed mass balancing as a possible Permit term. He did not view mass balancing as an effective way to estimate air emissions. He stated that mass balancing would involve taking many measurements, including of the material captured in baghouses, each with a margin of error. Mr. Robb considered the weight of particulate being emitted would be a fraction of the margins of error associated with all the measurements required in a mass balancing exercise.

[469] Mr. Robb also stated a zero-emissions facility could not be built and even attempting to come close would require an inefficient expenditure of resources. He stated that the concept of BACT was related: it is based on what emissions control has been installed in commercially viable applications in Greater Vancouver or elsewhere.

[470] Mr. Robb was also asked in cross-examination why stack tests of ES01A and ES01B occurred in alternating years from ES01C. He stated it should make no difference as stack testing should be done under normal operating conditions. He stated that staggered testing requirements are often done in permits because testing can be impactful to a business' operations.

[471] With respect to the lack of emissions treatment at ES02, Mr. Robb stated it was very rare to have a permit required to emit room air where employees work without personal protection. This is because the room air would have to comply with occupational health and safety limits and Metro conservatively estimates that air dispersion will lower the

concentration of emissions by a factor of ten before it impacts human health or the environment.

[472] For ES02 specifically, the Facility is authorized to emit 0.055 mg/m^3 of sulphuric acid, considerably less than the occupational exposure limit of 0.2 mg/m^3. The 2016 Stack Test showed actual emissions even less than the permitted amount: 0.019 mg/m^3. He described this margin of safety as considerable, given that it would violate the laws of physics for emissions concentrations at a point in the environment to be more concentrated than at the point where those emissions were released into the environment.

[473] By contrast, Mr. Robb advised that Metro has issued currently active air emissions permits authorising the release of hydrochloric acid with concentrations up to 10 mg/m^3. He is aware that British Columbia has issued air emissions permits with much higher concentrations than that, although he did not discuss specific details.

[474] When asked about other potential air contaminants generated from the Pickling Solution that are emitted from ES02, such as iron sulphate, Mr. Robb stated it was unclear if they were air contaminants and he felt assessing this was a low priority not justifying the expenditure of resources to determine if this was the case and, if so, at what level those emissions should be authorized under the Permit.

Metro's Expert Witness

David Tiplady

Qualification as an Expert

[475] Mr. Tiplady is a professional engineer and hydrogeologist with over 30 years of experience in the investigation and remediation of contaminated sites and the development, protection, and management of groundwater supplies. He has remediated several sites contaminated with metals, including large industrial sites. He has also formulated aquifer protection plans, well protection plans, and spill response plans to safeguard groundwater from contamination using a risk-based approach. His work was often undertaken with respect to water resource usage, water protection, and water conservation legislation and regulations in British Columbia.

[476] Metro called Mr. Tiplady and tendered him as an expert witness. The appellants did not oppose this tendering. The Board qualified Mr. Tiplady as an expert to provide an opinion on whether nickel and zinc emissions from the Facility would have a significant impact on soil, quality, groundwater, or surface water derived from groundwater.

Evidence

[477] Mr. Tiplady described groundwater modelling he does as part of his work. He uses a numerical model in which a study area is split into blocks, both horizontally and vertically. Each block is assessed for hydrological conductivity and storage capacity. The

direction and speed of water flow is measured, and then he models the flux of water moving in and out of each cell, in each direction. He can insert contaminants into this model to determine their behaviour in the subsurface, under the influence of groundwater.

[478] In this case, Mr. Tiplady used the maximum rate of accumulation for nickel and zinc in the study area as a result of the Facility's operations, as described in the 2017 Air Dispersion Report, as an input into his model. Conservatively, he assumed the nickel and zinc would be mixed to a depth of three meters, instead of the ten centimeters assumed in the 2017 Hemmera Report. Mr. Tiplady stated this decreased the amount of time needed for nickel and zinc to reach the groundwater by a factor of 30.

[479] Mr. Tiplady assumed aquifer characteristics and a depth to groundwater based on published regional data, which he considered to be conservative. He stated that gathering more site-specific information is labour intensive and is done only where less conservative characteristics than the regional background will be used.

[480] Mr. Tiplady's model calculated attenuation of the contamination, both vertically as it migrated toward the water table, and then horizontally with the flow of groundwater. Mr. Tiplady estimated the amount of time it would take for there to be measurable impacts to groundwater quality off the Site and to local waterways that are recharged by groundwater. He calculated that offsite impacts would take over 100 years to manifest.

[481] Mr. Tiplady compared the results of his modelling with soil quality standards from the *Contaminated Sites Regulation* applicable to agricultural land use. He concluded that the Facility's authorized emissions of nickel and zinc were unlikely to have a significant impact on soil quality, groundwater, and surface water, taking into account background levels of zinc and nickel.

[482] Mr. Tiplady also stated that the emissions were unlikely to impact aquatic life, including the life present in Erickson Creek, Twin Creeks, and the Little Campbell Aquifer. He based this on Provincial standards that were applicable in the circumstances, but whose development he could not explain.

[483] Mr. Tiplady's conclusions did not change after he reviewed Hemmera's 2020 dispersion modelling report.

[484] In cross-examination, Mr. Tiplady acknowledged factors not accounted for in his model: any fugitive emissions from the Facility, contributions of nickel and zinc from stormwater recharge of the aquifer, or the behaviour of ephemeral streams, which experience a higher-than-normal load of groundwater-borne contaminants when they begin to flow each year. Mr. Tiplady considered, in any event, that it would take many years for streams to experience a measurable impact associated with nickel and zinc from the Facility.

Ebco's Expert Witnesses

Bryan McEwan

Qualification of Expert

Evidence on Qualifications

[485] Mr. McEwen was called as an expert by Ebco with the following proposed areas of expertise:

- air dispersion modelling generally;
- conduct of air dispersion modelling;
- atmospheric modelling pertaining to air dispersion modelling;
- transport and deposition of air contaminants, from source to end point;
- regulatory use of air dispersion modelling;
- use of air dispersion modelling by regulators in permits and other evaluative decision-making, including selections of parameters to be modelled in these processes; and
- regulatory air quality standards applicable to air dispersion modelling outputs.

[486] Mr. McEwen had an undergraduate degree in physics, a diploma in meteorology, and a master's degree in atmospheric sciences. His thesis involved use of CALPUFF to perform simulated meteorology and model air dispersion of sulphur dioxide. He compared the predicted results with measurements from local monitoring stations. After moving into the workforce, he engaged in similar reliability testing of CALPUFF and other weather tools as predictive tools. He has also assessed various predictive weather tools for the government of British Columbia.

[487] Mr. McEwen has spent about half his career conducting air dispersion modelling in support of applications for air emissions permits and otherwise, with respect to a variety of industries, including mining, oil and gas, wood pellet plants, and foundries. He had not worked on a galvanizing plant's air dispersion modelling before. He testified he was familiar with ambient objectives throughout North America and elsewhere.

[488] Mr. McEwen had also made two or three policy recommendations to regulators but had never worked as a regulator. He has modelled the effects of policies used by other jurisdictions in making recommendations to a regulator and has peer reviewed air dispersion work done for regulatory purposes.

[489] At the time of the hearing, Mr. McEwen worked for Hemmera. He had spent over 20 years consulting in meteorological and air quality analysis, assessment, and permitting. He had conducted numerous air quality studies and air dispersion models, including for several large projects.

Positions of the Parties

Ebco

[490] Ebco submits that Mr. McEwen has vast experience and training with air dispersion models. He has truth-tested them in various airsheds and assessed different meteorological data sets that affect the models' output. He has used the models professionally in a variety of applications, including while predicting air dispersion of metals, gases, and aerosols at a variety of geographic scopes.

[491] Ebco says Mr. McEwen has significant experience with permits and assisting regulators. He is familiar with different regulatory criteria applied by different jurisdictions and the role air dispersion modelling plays in regulatory processes.

Metro

[492] Metro supported Mr. McEwen's certification as an expert witness without providing submissions of its own.

Appellants

[493] The appellants took issue with Mr. McEwen being tendered as an expert with respect to regulators' use of air dispersion modelling in permitting and other evaluative decision-making. The appellants argue Mr. McEwen had no experience with permitting related to galvanizing plants and the area of expertise, as described by Ebco, was vague. The appellants were also concerned that certifying Mr. McEwen as an expert with respect to the selection of parameters in air dispersion modelling would give him an inappropriate degree of control over the appeal process.

Ebco's Reply

[494] Ebco says that the question of the uses to which regulators put air dispersion modelling is one that is relevant to the appeal. While the appellants were concerned about expert certification on the inputs to be used in air dispersion modelling, Mr. McEwen understands Metro's processes and how it uses models. He has experience with possible contaminants of concern and has not only been involved in permitting but has contributed to regulator's policies using his expertise in air dispersion modelling.

Panel's Findings

[495] The Board accepted Mr. McEwen as an expert in:

- air dispersion modelling,
- the conduct of air dispersion modelling exercises, including the step-by-step process to develop and process the air modelling exercise and the robustness of air dispersion modelling,
- atmospheric modelling as it pertains to modelling exercises, and

- the transport and deposition of air contamination from its source to its end point.

[496] The panel finds that Ebco failed to establish Mr. McEwen's expertise with respect to the other areas of expertise described—the regulatory use of air dispersion modelling, the use of air dispersion modelling in permitting and other evaluative decision-making, and regulatory standards applicable to air dispersion modelling outputs. He described doing technical work to assess the validity of air dispersion modelling, both to predict air dispersion and meteorological events and to make recommendations on policies, which he has done two or three times. He has run models in support of his recommendations and in support of many permit applications over his career. This does not establish a general expertise in the use to which regulators put air dispersion modelling, even if he has some experience that gives him insight in some areas based on his experience.

[497] Additionally, it has not been established what role Mr. McEwen had, if any, in determining the appropriate parameters to input into air dispersion models on behalf of regulators, let alone that he has sufficient experience to have expertise in the proper selection of parameters to input into air dispersion models. As a result, the panel is not satisfied that Mr. McEwen has expertise in the use of air dispersion modelling by regulators to the extent that it includes the selection of parameters to be modeled.

[498] Furthermore and independently, the panel is concerned that the question of what the appropriate parameters are for air dispersion modelling decision-making strays beyond the appropriate role of an expert. This proposed area of expertise was suggested as part of the decision-making process, which the Board's role is ultimately to address. Mr. McEwen's expertise in this area was presented as a function of his involvement with decision-making previously, not as a function of his understanding of chemistry, atmospheric sciences, or other objective studies. This strays into the weighing of evidence, which is within the sole purview of the panel. Accordingly, Mr. McEwen's evidence in this area is not needed based on the criteria from *Mohan*.

[499] Lastly, while Mr. McEwen had doubtlessly applied regulatory standards previously, he did not describe having sufficient training, education, or experience to amount to expertise in the development of those standards. The Board does not require assistance with determining the appropriate regulatory standard to apply, meaning that Mr. McEwen does not satisfy the requirements of an expert witness on that issue based on the criteria from *Mohan*.

The 2017 Hemmera Report

[500] Because Mr. Milner retired from Hemmera between 2020 and when Ebco presented its case in the hearing, Ebco had Mr. Milner's work in the 2017 Hemmera Report and the 2020 Hemmera Report reviewed by his successor, Mr. McEwen. Mr. McEwen concluded that Mr. Milner's work was appropriately designed and executed. Mr. McEwen adopted the analysis and conclusions from the two Hemmera reports.

[501] In doing so, Mr. McEwen verified there were no transcription errors or other irregularities in the inputs, the model domain (the size and spacing of grid cells) was done appropriately, and the procedure followed applicable standards for air dispersion modelling in British Columbia. He confirmed the outputs, for both the CALMET predictions and the CALPUFF results, did not raise any concerns with the modelling process.

[502] Mr. McEwen noted that both reports from Hemmera were conservative to the extent that:

- emissions were based on maximum concentrations and working hours authorized under the Permit, not the lesser concentrations and hours that the Facility was active in reality;
- in respect of each emission, the maximum concentration in each grid space within the study area over the modelled year was used for all subsequent calculations;
- background measurements of all air contaminants were assumed to be constant at the highest value of the 98th percentile readings from the three monitoring stations referenced in this case; and
- emission concentrations were compared against ambient air quality objectives, which are inherently conservative and based on exposure thresholds for vulnerable populations, including children and seniors.

[503] Mr. McEwen considered these conservative safeguards sufficient to account for any inaccuracies in modelling relating to the removal of contaminants from the air onto wet surfaces.

[504] With respect to building downwash, Mr. McEwen stated that it would be relevant in the context of these appeals only with respect to the Facility: other buildings were too far to affect the Facility's emissions. The building downwash was certainly impactful on the Site in the proper wind conditions, and may at times be impactful to SL1A, but not so far as SL2 or beyond.

[505] Mr. McEwen noted that, while CALPUFF can be programmed to simulate chemical transformations, it does not need to do so. Simulating chemical transformations increases the complexity of the model and requires a sufficiently large emissions field to allow chemical transformations to take place. Furthermore, not factoring in chemical transformations is conservative for the amount of the emitted contaminant.

[506] Stepping beyond the bounds of the 2017 Hemmera Report, Mr. McEwen decided to model for the dispersion of cadmium and lead from the Facility because it was present at greater than 50% of ambient levels in the 2022 Stack Test. He also modelled for hydrogen chloride as authorized under the 2020 Permit. He reported that none of these possible air contaminants exceeded applicable ambient air quality objectives.

[507] Mr. McEwen was asked in cross-examination about what he would expect if the roof vents were passed through a scrubber and discharged out of a stack. Mr. McEwen stated that the plume from ES02 would be different, as it would be at a higher elevation, leading to greater dilution and less downwash.[9]

Comments on Mr. Oeh'r Opinion

[508] Mr. McEwen reviewed Mr. Oehr's opinion and disagreed with it. Specifically, Mr. McEwen stated there was no justification for the assumption that the increase in metals at SL1A and SL2 was due entirely to air deposition from the Facility. Mr. McEwen stated that a dustfall analysis would be needed to explore the extent to which aerial emissions may be contributing to changing metals concentrations at those locations.

[509] Furthermore, Mr. McEwen says that the correlations attributed to the data by Mr. Oehr were not supported by evidence. These sorts of deficiencies are guarded against in modelling by the standards and procedures in modelling mandated by British Columbia's Ministry of the Environment and by Metro.

[510] Mr. McEwen also took issue with what he described as Mr. Oehr's selective use of data.

[511] Furthermore, Mr. McEwen stated that air deposition models typically overpredict impacts and he has never seen such a dramatic underprediction as described by Mr. Oehr. It is not in keeping with his experience and it is at odds with studies of these models undertaken over decades by the United States Environmental Protection Agency and the Province of British Columbia, as well as validation studies he has personally done. Mr. McEwen states that models underpredicting impacts are so rare that they end up being described in scholarly articles. The typical range of overprediction is from 10% to 40%.

Ron Haley

Qualification as an Expert

[512] Ebco called Mr. Haley as an expert witness. Mr. Haley has an undergraduate degree in genetics and a graduate degree in biochemistry. He has over 30 years of experience in the assessment of contaminants on human health and the environment. He has been approved as an air quality risk assessment consultant in multiple jurisdictions, including British Columbia, and holds several environmental certifications, including being a qualified Environmental Professional.

[9] Mr. McEwen also discussed whether he would expect sulphuric acid emissions to be reduced. Mr. McEwen had not been certified as an expert in scrubbers, emissions control technology, or the treatment of sulphuric acid effluent or effluent generally from facilities, galvanizing facilities, or the Facility specifically, so his opinion on that question was not properly admissible to the Board.

[513] Mr. Haley has completed over 300 human health and environmental risk assessments, many of which related to air quality and many of which involved applying regulatory criteria such as AAQOs or figures listed in the *Contaminated Sites Regulation*. These assessments included estimating human exposure to contaminants and the resulting impacts. Mr. Haley has studied how various chemicals interact with organisms. He has worked with metal exposures and has based his assessments off air dispersion analyses but is not himself an air dispersion modeller. He has experience with zinc, nickel, and ammonia across all ecological receptors, but not in the context of a galvanizing plant specifically.

[514] There were no objections to Mr. Haley's certification. The Board qualified Mr. Haley as an expert in:

- regulatory standards for contaminants, for the protection of human health and the environment, and how those standards are derived;
- assessments of the effects of contaminants on human health and the environment, including through the application of regulatory standards for contaminants; and
- human toxicology.

2017 Human Health and Environmental Risk Assessment

[515] Mr. Haley began his analysis with the 2017 Hemmera Report. He stated that air dispersion modelling generally was peer reviewed and accepted by the scientific community.

[516] Mr. Haley compared the maximum concentrations of nickel and zinc from the 2017 Hemmera Report against applicable regulatory air quality criteria: Metro's AAQOs and, where there were none, the most stringent values from standards published in Ontario, Texas, and Alberta. Mr. Haley selected those jurisdictions because they use similar processes to Metro in setting air quality standards.

[517] Mr. Haley stated there were no expected exceedances of those air quality criteria, meaning there were no expected impacts on human health or the environment because of nickel and zinc exposures through air and soil. Mr. Haley noted that these air quality standards consider impacts to vulnerable populations, including those with asthma and pulmonary conditions. The standards are conservative and do not necessitate further studies to account for sensitive populations.

[518] While this would normally be the end of a risk assessment, Metro asked Mr. Haley to do more. He assessed the "normal operating conditions" scenario from the 2017 Hemmera Report and found the predicted air contaminant concentrations to represent a small fraction of the applicable standards. Mr. Haley concluded that any potential impact due to the deposition and accumulation of zinc and nickel from the Facility was negligible.

[519] Mr. Haley also considered the rate of accumulation of nickel and zinc predicted in the 2017 Hemmera Report and stated that the potential for adverse impacts to vegetation, soil, surface water, and groundwater by the same mechanisms were negligible, with no detectable (greater than 10% increase, given variability in typical sampling results) in nickel and zinc concentrations for hundreds to thousands of years. This analysis was based on soil density information from Ministry of the Environment guidelines, as well as background zinc and nickel concentrations in the soil, based on protocols established in the *Contaminated Sites Regulation*.

[520] Mr. Haley calculated that it would take zinc concentrations hundreds to thousands of years to reach the level where they may potentially cause impacts to human health and the environment, based on British Columbia Ministry of the Environment soil matrix standards. These standards reflect possible concerns related to drinking water and aquatic life.

[521] Mr. Haley carried out the same exercises using the 2020 Hemerra Report as well, once it was available. There was no change in his conclusions.

[522] In the hearing, Mr. Haley described several elements of conservatism within his analysis, beyond those inherent in the Hemerra reports:

- he assumed the Facility would operate continuously, constantly emitting the air contaminants he was studying into the environment, although that was not authorized under the 2020 Permit;
- regulatory standards for soil quality were calculated with conservative assumptions; and
- his calculations did not account for expected reductions in the concentration of zinc and nickel in the receiving environment due to natural processes, such as dilution due to rain or other precipitation.

[523] Mr. Haley agreed in cross-examination that acidic pH in soil increases the mobility of metals. He stated that this could shorten the times he calculated for potential human health or environmental impacts, but by about 50% at most. The times he calculated would still be hundreds to thousands of years, other than at the Site boundary, where effects may manifest, assuming greater metal mobility due to acidic soil conditions, within about 50 years.

[524] Mr. Haley also recognized a limitation in his work being that it did not account for any fugitive emissions.

[525] Mr. Haley was also asked about risks associated with lead. He noted the lack of air dispersion modelling associated with lead emissions from the Facility. He explained that one could estimate the time required until lead concentrations would have a measurable effect or until they become a potential risk to human health or the environment. Because lead particulate from the Facility would behave similarly to nickel and because the two metals have identical soil concentration thresholds under the Contaminated Site

Regulation, the times for lead concentration to rise in affected soil can be correlated to the lead concentration in the ambient air. Based on these relationships, Mr. Haley concluded that lead was likely to have a negligible impact on human health and the environment within the life of the Permit.

[526] Mr. Haley was also asked about biological impacts of gaseous acid strong enough to tarnish silver. He stated that an acidic aerosol or cloud could do so and could irritate eyes and the respiratory tract. Mr. Haley added that the data did not suggest sufficient acidic exposure to explain these effects, however.

Eric Choi

Qualification as an Expert

[527] Ebco called Mr. Choi, a professional engineer with Envirochem, as an expert witness. Mr. Choi has over two decades of experience conducting and overseeing environmental investigations and monitoring, including hundreds of surface water, groundwater, and stormwater projects. His work experience includes the development and implementation of hydraulic and hydrogeologic engineering programs for clients with sites both during construction and during the operational life of projects. He has also applied regulatory standards for soil and water quality based on exposure limits for the environment and human health. He has designed and implemented sampling programs to help ensure compliance with regulatory limits on water quality. He has also done plant tissue sampling studies, but says those are rarely requested. Mr. Choi has commonly worked on sites with metal contamination concerns over the course of his career.

[528] There were no objections to the certification of Mr. Choi as an expert witness. The Board qualified Mr. Choi as an expert in the following areas:

- the development of programs to assess the presence and concentration of potential contaminants in various media: soil, ground water, surface water, stormwater, and plant tissue;
- the interpretation and assessment of results of said programs; and
- the application of established standards, including regulatory standards, applicable to potential contaminants in the media listed above, and which may pertain to the environment and human health.

Evidence

[529] Mr. Choi stated that trends over time in the results of environmental monitoring were the best measure of environmental change. He stated that comparison to established criteria like the *Contaminated Sites Regulation* or the BCWQGs were flags for possible environmental impacts but not, in and of themselves, indications of changing conditions. He noted that there were places in British Columbia where naturally occurring

metals concentrations in soils were above the thresholds listed in the *Contaminated Sites Regulation*.

[530] Mr. Choi considered that elevated zinc concentrations detected at SL1A likely related to zinc being carried down from the Site by surface water, after de-vegetation and erosion of the Bioswale that would normally drain that water into the Site's lawn drains. He noted this was consistent with runoff having been related to the elevated zinc measurements in the lawn drains themselves, but thought further investigation was needed to rule out air emissions as a contributing factor.

[531] Mr. Choi noted that, after the restoration of the Bioswale, sampling results showed no further increase in zinc levels in the soil at that site and a decrease in the zinc content of plant tissue at the site from 125 mg/kg to 81 mg/kg between February 2021 and July 2022. Mr. Choi considered these results to support his theory that the elevated zinc readings were attributable to a failure of the Bioswale.

SUBMISSIONS

Appellants' Submissions

General Comments

[532] The appellants say that the Board's role is to consider whether to authorize the discharge of air contaminants in this case and, if so, to consider what requirements are advisable for the protection of the environment. This involves consideration of whether the emissions:

- may cause harm to the environment itself,
- injure or are capable of injuring the health or safety of a person, and
- cause or are capable of causing material physical discomfort to a person.

[533] The appellants submit that the Board should take a cautious and technically rigorous approach to these issues, including undertaking a comprehensive technical analysis of the potential harm that the proposed emissions may cause to human health and the environment. Such permits must be capable of being accurately measured and enforceable and must have a duration that appropriately balances the permit holder's business needs and the public interest in minimizing harmful effects of air contaminants to be discharged. This was the manner in which the Board approached an appealed air emissions permit in *GFL Environmental v. District Director, Environmental Management Act*, 2021 BCEAB 3 (CanLII) (*GFL*).[10]

[10] Paragraphs 431, 512, and 677–679.

[534] The appellants also argue that emissions are only authorized "provided that any risk to the environment can be properly controlled, ameliorated and, to the extent possible, eliminated," referencing *Don Tegart v. District Director, Greater Vancouver Regional District*, 2019 BCEAB 11 (CanLII) (*Don Tegart*).[11] Furthermore, the appellants say that permitting under the *Act* and the Bylaw is intended to balance "the potential risk of harm to human health and the environment associated with the proposed discharge of waste, and weigh those risks against the potential benefits of the activity and other societal interests."[12]

[535] The appellants argue that the evidence establishes that the Permit is not sufficiently protective of human health or the environment and that, in any event, it allows Ebco to cause pollution. The appellants further argue that the risk to the environment resulting from the emissions has not been properly controlled, ameliorated, or to the extent possible, eliminated by the terms of the Permit.

Protection of Human Health

[536] The appellants say that evidence presented at the hearing establishes that emissions from the Facility:

- cause harm to the environment;
- cause, or are capable of causing, injury to the health or safety of a person; and
- cause, or are capable of causing, material physical discomfort to a person.

[537] In support of this argument, the appellants assert that local people (including the appellants) have suffered prolonged, adverse effects from the Facility's emissions, which appear as white, cloud-like discharges. The appellants specifically reference several complaints made to Metro, reporting one or more of the following symptoms:

- a taste, including an "acidic," rotten, or metallic taste;
- a toxic, bitter, sour, and/or chemical smell, including a smell like sulphuric acid;
- burning or irritation of the sinus and throat and/or watering of the eyes;
- nausea;
- coughing; and
- congestion of people and animals.

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[11] The appellants referenced paragraph 86, which quoted from *Emily Toews v. Director, Environmental Management Act*, 2015 BCEAB 23, at para. 232.

[12] The appellants reference *Don Tegart*, at para. 287, quoting from *Rolf Bettner on behalf of Haida Gwaii Marine Resources Group Association v. Director, Environmental Management Act*, 2006 BCEAB 8 (CanLII) (*Bettner*), at p. 19.

[538] The appellants note that there had been no statistical or systemic analysis of these complaints to determine their probable source. The appellants argue that the lack of any positive or productive response made the public less likely to complain about the emissions from the Facility.

[539] The appellants note that complaints were often "dismissed" by Metro based on replies from Mr. E. Eppich attributing observations and symptoms to meteorological phenomenon. The appellants say that Mr. E. Eppich does not have expertise that would allow his opinion to be accepted, and Metro has not investigated whether the observed cloud-like and fog-like occurrences around the Facility were natural or were emissions from the Facility. Furthermore, Metro "dismissed" the November 29, 2018, complaints by Mr. Lavert and Mr. Wood based on meteorology, despite both providing direct information about weather conditions at odds with the information Metro relied on.

[540] The appellants reference *Don Tegart*, in which the Board concluded that intermittent malodorous emissions were enough to conclude that an air emissions permit was not suitably protective of human health and the environment because the emissions had negatively impacted the ambient environment and the lives of some appellants in that case. The appellants argue that the facts of this case are similar: intermittent emissions from the Facility have been malodourous and affected the air they breathe, their lives, their business, their health, and the health of farm animals, pets, and wildlife, including salmonids in Erickson Creek and Twin Creeks. The appellants say this causes pollution, as defined in the Bylaw.

[541] The appellants also reference Metro's Notice of Violation issued to Ebco on March 15, 2021, in respect of the emission of ammonia beyond the levels authorized under the Permit.

[542] They argue that, as described in Mr. E. Eppich's testimony, Stripping has been the most common cause of complaints since the Facility began operating in 2016, due to hydrogen chloride releases into the air. The appellants say Stripping (including the cleaning of baghouse filters) is not a permitted activity in the Facility. They also note that Ebco had released hydrogen chloride during 2018 Stack Testing of ES01 above Alberta's Ambient Air Quality Objective for one-hour exposure of 75 µg/m^3.[13]

Protection of the Environment

[543] The appellants say that the foal miscarriages at IronGait also support the conclusion that emissions from the Facility cause harm to the environment and have caused IronGait to stop its horse-breeding operation. They argue that Mr. Mueggenberg's evidence and Mr. Lavert's evidence—including the photographs he had taken—shows that

[13] A direct citation was not provided; however, this figure was quoted in Exhibit 215: the July 2, 2020, recommendation memo sent to Mr. Robb, recommending the approval of the 2020 Permit.

wind patterns around IronGait Farm during winter months involve low wind speeds that spread emissions toward IronGait Farm. The appellants also say that Mr. Wood's testimony was consistent with this conclusion, as he saw a heavy smoke-like fog travelling from the north onto IronGait lands.

[544] The appellants say that weather data from a weather station in White Rock, British Columbia, from December 25, 2018, to January 7, 2019, and from February 1, 2019, to February 14, 2019, supports their conclusion. They say winds likely deposited emissions from the Facility on IronGait lands.

[545] The appellants say that the horse stalls of the broodmares that lost foals were in the path of emissions from the Facility and were open to the north. The appellants noted that it was unusual to experience three losses of foals *in utero* within a short timeframe. The appellants note that a veterinarian could not rule out the contribution of heavy metal or industrial impacts and that, before those three foal losses, no foals had been lost *in utero* at IronGait.

[546] The appellants also say that the Facility's emissions may be impacting the Brookswood Aquifer, which Ms. Tompe's family relies on for irrigation and drinking water. The appellants add that this may affect other people and waterways, which rely on the Brookswood Aquifer.

[547] The appellants argue that the expert witnesses establish environmental harm to soil near the Facility (as explained by Mr. Oehr) and to watercourses near the Facility (as explained by Mr. Armstrong). They say the evidence of Dr. Lanphear establishes harm to human health and the testimony of Dr. Bolton establishes that Ebco's soil, water, and plant tissue testing underestimates the Facility's impacts on the environment.

Flaws in Measurement

[548] The appellants argue that Mr. E. Eppich's testimony established that emissions monitoring at the Facility is "illusory." Mr. E. Eppich acknowledged in his testimony that Pickling produces hydrogen "bubbles" that cause a "pinching sensation in the nose." Furthermore, Mr. E. Eppich stated that Ebco adds Anti-Vapour to the Pickling Tanks when they can sense acid in the air of the Facility, although he did not describe the specifics of how employees detect acid in the air or why Anti-Vapour was not used continually or on a schedule to prevent the acid from being detectable in the first place.

[549] . Mr. E. Eppich testified that staff walk on the roof and sniff to try to detect emissions, once every "couple of months." The appellants say these facts show emissions from ES02 have effects on people. The appellants argue better monitoring of ES02 is required.

[550] The appellants note only the 2016 Stack Test checked emissions at ES02, despite the fact that it is the most likely cause of complaints from the Appellants, based on information from a Hydrogen Chloride Safety Data Sheet and a Hydrogen Chloride

Hazardous Substance Fact Sheet that were entered into evidence, as well as the corroborating testimony from Mr. Mueggenberg, Mr. Thielemann, and Mrs. Thielemann.

[551] The appellants argue that there was jurisdictional uncertainty between Metro and the City of Surrey, with neither taking on responsibility for activities occurring within the Facility and elsewhere on the Site. The appellants rely on the testimony of Mr. Oehr in support of that assertion.

[552] The appellants say that single testing of ES02 was unreliable for the following reasons:

- it tested only for sulphuric acid;
- it captured emissions from only one of eight roof vents;
- the vent from which samples were taken were above the caustic tank and not above the Pickling Tanks, where expected emissions were greater;
- it relied on a "make-shift plywood 'stack' structure" that altered test results, according to the testimony of Mr. McEwen; and
- it may have been done when doors in the Facility were open, altering the airflow and therefore the sampling of air being vented out of ES02.

[553] The appellants note that Mr. McEwen testified that a wet scrubber treating the exhaust from ES02 would require a stack, which would make testing easier than the current configuration, which required a plywood structure used during Stack Testing in 2016.

[554] The appellants state that use of this flawed data undermines the air dispersion modelling upon which it relied, and the Permit, which relies in turn on that report. The appellants add that the air dispersion modelling report is also undermined by the lack of data ahead of time: there was not 90 days of average emissions measured during production at the Facility. Additionally, the appellants argue that the emissions associated with Stripping—which involves reactions including ammonium salts, zinc, nickel, and other additives and results in hydrogen chloride emissions—and other activities have never been tested.

[555] With respect to ES01, the appellants say that Dr. Preston testified that Metro does not require opacity monitoring at the Facility because they assume the baghouses are operating efficiently and there are no other opacity sources.[14] The appellants note that the sampling schedule of ES01 mean that all three stacks are never tested at the same time.

[14] The appellants provided a reference for this contention. The point of reference does not say what the appellants represent it as saying: it says that opacity measurements are not dependent on Stack Testing being representative of the Facility's operations, and can be done to ensure compliance with the Permit.

The variability in test results from Stack sampling suggest improper controls and problems in sampling and testing, according to the appellants.

[556] The appellants argue that Envirochem's reports (Oct 22, 2019 letter, April 2020, and April 2021) reference Hemmera's air dispersion modelling and similarly suffer from relying on this flawed data. The appellants also argue that Dr. Bolton's testimony establishes deficiencies in Envirochem's sampling program. The appellants rely on Dr. Bolton's testimony in arguing that more sampling was required to determine impacts to soil, water, and plant tissues around the Facility, and that mass balancing should be undertaken to determine the impacts of operations at the Facility.

[557] With respect to monitoring of the soil, plant tissue, and water quality, the appellants argue that Mr. Oehr's testimony established gaps in the approved sampling methodology, although they do not provide any specific references within his four days of testimony. Furthermore, differences between the design parameters of infrastructure at the Site and how it was built (such as the drains capturing and monitoring stormwater) lead to unreliable results.

[558] Even with those limitations in mind, the appellants say that results from Envirochem's sampling program shows the presence of consistently elevated zinc and nickel in lawn drains on the Site. This has led Envirochem to try to isolate the contributions from air deposition from other factors influencing these elevated results. The appellants also specifically note that sampling in 2019 at stormwater sample location LD-9 exceeded applicable BC Water Quality Guidelines for freshwater aquatic life in respect of total and dissolved zinc concentrations.

[559] The appellants are concerned that the sampling results of the lawn drains are artificially low because of evacuation and cleaning of several lawn drains during the sampling process, the relocation of galvanized materials on site, the vacuuming and sweeping of the exterior between sampling events, improper installation of lawn drains (specifically, having one or more intakes above ground level and a lack of gasket seals in some locations), and otherwise redirecting surface water at the Site. As a result, based on the testimony of Mr. Oehr and Dr. Bolton, Envirochem's sample results from 2019, 2020, and 2021 are unreliable.

[560] The appellants argue that a continuous emissions monitoring system would be appropriate given that the Facility operates day and night. Continuous emissions monitoring would provide the best data on emissions from the Facility.

Limitations and Flaws in Modelling Data

[561] The appellants argue the experiences documented in the complaints to Metro should be preferred over modelling information. Furthermore, the appellants say that Mr. McEwen's testimony establishes several limitations of the 2017 Hemmera Report and the 2020 Hemmera Report:

- ES02 emissions considered only sulphuric acid;
- Emissions from ES01C were not considered;
- the dispersion of contaminants within the Facility or the variability of conditions within the Site that may affect downwash were not considered;
- modelling did not factor in downwash; and
- modelling was based on regional, Lower Mainland climate data and did not account for microclimates in the more local area (Hazelmere Valley and Campbell Heights).

[562] The appellants reference Mr. McEwen's testimony to argue that downwash may result in mixing of the emissions from ES01 and ES02 before it travels through the green space west of the Facility, mixing further in the trees there. The appellants rely on the evidence of Mr. Robb, where he discussed chemical interactions expected from the mixing of sulphuric acid emissions and zinc chloride in the environment. The appellants argue that hydrogen chloride is the most likely source of the toxic white "cloud" and the acidic odour/taste described in the complaints filed with Metro.

[563] Specifically with respect to the last point, the appellants say that local microclimates affect the dispersion (and therefore the deposition) of air contaminants emitted from the Facility. Additionally, the appellants say that low windspeeds and wet air from local waterways and farmlands create an environment that inhibits the dispersion of air contaminants and so increases its local deposition and local impacts from emissions.

[564] Overall, the appellants argue that the predicted impacts to human health and the environment were underestimated by the modelling in this case, and for a model to be reliable, it would need to be based on accurate baseline data and account for both downwash and local meteorological phenomena.

[565] Additionally, the appellants say that the 2017 Hemmera Report does not reliably describe a lack of environmental impact. No biologist participated in the drafting of the report and a biologist's opinion is necessary to describe any impacts to fish in waterways near the Facility and to livestock on nearby farms.

Insufficiency of the Permit Terms

[566] The appellants argue that the terms of the Permit have been exceeded during the Facility's operation. They reference the following six incidents:

- on May 4, 2016, an Ebco employee performed a dip while a baghouse was being installed, resulting in untreated emissions from the hot dip Kettle;
- on May 29, 2016, and on September 21, 2019, one or more Ebco employees opened a door of the hot dip Kettle during dipping, contrary to established procedures, resulting in fugitive emissions from the Kettle escaping out the roof vents;

- on May 17, 2020, an Ebco employee failed to properly drain parts before galvanizing because of rapid rates of work, resulting in unauthorized hydrochloric acid emissions from ES01A and ES01B;
- during an October 16, 2020, stack test, the measured flow rates of the effluent stream from ES01 (454, 397, and 388 m^3/minute) exceeded, on average, the Permit-authorized flowrate of 396 m^3/minute (even though the associated report from Lanfranco described a calculated "standard flowrate" of 384 m^3/minute); and
- during the same October 16, 2020, stack test, the concentration of ammonia in discharges from ES01C was measured at 2.77, 8.34, and 4.89 mg/m^3 and had an average concentration of 5.34 mg/m^3, exceeding the Permit limit.

[567] The appellants noted that the stack test report indicates the largest measurement of ammonia on October 16, 2020, came during "… the largest 'dips' by weight and surface area."[15] The appellants argue this supports the conclusion that the largest dips at the Facility regularly result in the discharge of air contaminants beyond what is allowed under the Permit. They also argue that a two-year interval for the testing of any given emissions source (01A, 01B, or 01C) is too long, providing inadequate safeguards for compliance with the Permit and for protection of the public. The appellants argue this is particularly so given the flawed testing methodology, where only some portions of ES01's emissions are tested at any one time.

[568] The appellants add that brown staining on the roof of the Facility, in its roof vents and associated fans, and on the pavement northwest of the Facility indicate that unauthorized iron sulphate emissions are being emitted from the roof vents. The appellants note that Mr. E. Eppich conceded, in cross-examination, that these stains were from small particles of iron sulphate discharged, through the roof vents, into the environment.

[569] The appellants also note that emissions of cadmium and lead, unauthorized by the Permit, have been emitted. The appellants rely on the evidence of Mr. Oehr (September 6, 7, and 22, 2022) and Dr. Lanphear (April 18, 2019) to argue that these emissions exceeded safe levels. The appellants also note that cadmium concentrations measured at 0.023 micrograms/m^3 exceeded limits set in Ontario (0.005 micrograms/m^3), relying on Mr. Oehr's report and testimony in support of those figures.

[570] Although the appellants note that Metro has attempted to impose more strict terms under the Permit during the course of the appeal, they argue that the effects of emissions from ES02 are ongoing. This establishes that the Permit (both in its original form and in the 2020 version) are insufficiently protective of the environment.

[15] Page 14.

[571] Furthermore, the appellants say that the 2020 Permit terms allow greater emissions from ES01 because, while allowable contaminant concentrations were halved, the overall volume of effluent authorized under the Permit more than offset that reduction. Furthermore, the appellants say the fugitive emissions plan only addresses potential fugitive emissions from the hot dip Kettle and do nothing to prevent fugitive emissions from the Facility otherwise, such as those associated with Stripping. In support of this contention, the appellants reference complaints filed with Metro in each of 2021 and 2022, when Stripping was underway at the Facility.

Insufficient Emissions Control

[572] The appellants note that there is no emissions control on the roof vents, through which air above the Pickling Tanks is vented into the environment. The appellants argue that Mr. Robb testified on August 6, 2020, that a wet scrubber would help mitigate impacts arising from the release of emissions from the roof vents. The appellants also reference Dr. Bolton's testimony in stating that an alkaline scrubber would mitigate emissions from the Facility, down to PM2.5.

[573] The appellants note that a wet scrubber is used for emissions control in the only other batch hot-dip galvanizing plant in the Lower Mainland that is regulated by Metro: the Silver City Facility. This requirement has been present since 2011 and was imposed following numerous public complaints. The compounds regulated by Silver City's permit, to address the "clouds" of emissions from the Silver City Facility, were determined based on Mr. Robb's review of relevant material data safety sheets and his understanding of galvanizing reactions. There are also sampling requirements for the discharged treated through the wet scrubbers at the Silver City Facility.

[574] The appellants say that the complaints in this case mirror those about the Silver City Facility leading up to 2011: both involved clouds of emissions that give rise to burning and stinging sensation, irritation in the eyes, and foul tastes in the mouth. The appellants say that, even if it is unusual for scrubbers to be required for ventilation from areas where workers work, the recommendation to Mr. Robb indicated that wet scrubbers were BACT for capturing acidic gas emissions.

[575] The appellants argue that, given that the Silver City Facility is located in an industrial area and the Facility is located near farmland and residences, more stringent emissions controls should be expected of the Facility. The appellants note that a wet scrubber was recommended to treat the emissions from ES01 in the Approval by both Ms. Silva and Mr. Yuen, yet Mr. Robb did not include that requirement in the Permit. The appellants argue that, since the Silver City Facility is able to operate with one in place, this should not be an undue or disproportionate burden for Ebco.

[576] The appellants say that, because the Permit does not require a wet scrubber, it is insufficiently protective of human health and the environment. The appellants say that a wet scrubber is BACT with respect to acidic emissions and the Permit, as it reads currently,

does not require a BACT assessment for the Facility until 2029, with no implementation until 2030. The appellants argue that Ebco has benefited from running the Facility without BACT in place since 2016 and the Board should address this deficiency in the Permit.

Insufficient Complaint Response

[577] The appellants argue that Ebco does not do enough to report on complaints it receives or to detail follow up actions taken or proposed. The appellants also say that Metro also fails to respond adequately to complaints filed with it, in respect of the Facility. The appellants say this leaves them with no accessible remedy for their complaints. They argue this also further discourages complaints, which deprives Ebco and Metro of information regarding operations and deficiencies at the Facility. The appellants argue this inadequate complaint response system emphasizes the need to reverse the Permit.

[578] The appellants say, without providing a specific reference, that Mr. Armstrong also testified that Metro had investigative capacity but did not want to use it in this case.

Conclusion

[579] The appellants say the Permit should be reversed, as there is no way to revise the Permit to sufficiently protect the environment and it is not possible to properly control, ameliorate, or eliminate the risk to the environment arising from the Facility and its emissions. Specifically, the appellants reference Ebco's repeated incidents of noncompliance with the Permit, the discharge of non-permitted chemicals like cadmium and lead into the environment, the unresponsiveness of Ebco and Metro to complaints from the Facility's nearest neighbours, the lack of a wet scrubber as BACT, and ongoing inadequacies in monitoring, testing, reporting, and modelling of emissions and their impacts.

[580] Alternatively, the appellants argue that the Board should amend the Permit to, at a minimum:

- mandate the use of a wet scrubber as BACT on ES02, with appropriate associated monitoring, testing, and reporting, and with appropriate treatment and disposal of scrubber wash water;
- require higher standards for monitoring, testing, and reporting of
    - emissions from ES01 and ES02, and
    - soil, plant tissue, and water quality,

    including by testing emissions sources at capacity and requiring testing more frequently and with more stringent requirements;

- require real-time continuous emissions monitoring from the Facility, to give Metro reliable data on the sufficiency of the Permit and to allow prompt remedial action at the Facility where necessary;
- require testing of ES01 and ES02 every twelve months (as is the case with the Silver City Facility), with testing arranged to ensure that
    - ES01A, ES01B, and ES01C are all tested at the same time,
    - all activities at the Facility are performed during testing, including activities in the Pre-Treatment Area, such as Stripping,
    - the weight and surface area of dipped items is properly recorded and referenced against emission sampling data,
    - data on filters is "properly recorded,"
    - sludge from an installed wet scrubber is sampled and tested,
    - observations from a qualified professional are properly recorded, and
    - test results are made publicly available in a reasonable period of time to restore public confidence in Metro's protection of air quality;

  so that there is a better safeguard against malfunctioning emissions sources and the manipulation of venting to minimize test results, to improve data collection and assessment of emission control at the Facility, and to appropriately reflect the history of measured events where the Permit terms have been exceeded;

- require soil, plant tissue, and water sampling every six months, with any "exceedances" to be reviewed by a properly qualified professional;
- require testing for cadmium and lead emissions from ES01, with conditions for maximum concentrations defined in the Permit;
- require simultaneous testing for air contaminants from all roof vents comprising ES02, with conditions for maximum concentrations defined in the Permit:
    - ammonia,
    - ammonium chloride,
    - chlorine,
    - nickel,
    - zinc,
    - hydrogen chloride,
    - particulate matter,

    - cadmium, and
    - lead;
- require the installation and operation of weather-monitoring equipment at the Site to account for the variability of local weather and to mitigate harms from the release of air contaminants from the Facility;
- require Ebco to submit the BACT Assessment Plan indicated in the Permit on a specific timeline beginning in 2025; and
- set a Permit expiry date of no later than February 28, 2026, to safeguard against pollution from the Plant and impacts to human health and the environment, and to ensure sufficient data is present before the long-term release of air contaminants is authorized.

[581] In the further alternative, the appellants ask the Board to return the decision to the District Director, with instructions to consider the issues and conditions described above. Additionally, the appellants ask that, in referring the matter back to the District Director, the Board ask her to determine whether additional air quality modelling is required. The appellants also ask that the District Director, when asked to consider the expiry date for the Permit, consider evidence of adverse impacts to human health and the environment arising from emissions from the Facility, evidence of cost-effective measures to mitigate those impacts, and the benefits of reviewing testing data and considering reasonable mitigation measures before a longer-term permit is contemplated.

District Director's Submissions

[582] The District Director asks that the Board confirm the Permit in all appealed iterations and dismiss these appeals. The District Director says the Permit resulted from a fair, transparent, and rigorous application review process. The Permit resulted after considering public and agency input, as well as technical and other relevant information. The District Director considers the Permit to be protective of the environment and in the public interest.

[583] In particular, the District Director says there are numerous examples (which the District Director lists specifically) which support that the Permit is protective of the environment and in the public interest, and not solely in Ebco's interests, as the appellants argue. Each of the Permit amendments have, in the submission of the District Director, strengthened the Permit for improved protection of the environment.

Identification and Behaviour Emissions

[584] With respect to the processes in the Facility, the District Director stated that the appellants provided no evidence to describe the chemicals produced by Stripping and cannot substantiate a claim that hydrogen chloride gas is produced by that process.

Specifically, while Mr. E. Eppich may have described his understanding of what was in gaseous emissions from the Facility, Mr. E. Eppich was not an expert witness and could not provide a valid opinion to the Board on the chemical composition of those emissions. The District Director further notes that Mr. E. Eppich specifically stated that he had never seen hydrochloric acid give off a white cloud while in any of Ebco's facilities. Furthermore, the District Director had not received any information from Ebco to support that hydrogen chloride was produced as part of operations at the Facility.

[585] Furthermore, the District Director argues that the appellants provided no evidence to support that Stripping was the most common cause of complaints since the Facility began operating. Additionally, some complaints (such as those dated March 5, 2020; August 6, 2020; and August 28, 2020)[16] specifically describe a sulphuric acid smell, not a hydrogen sulphide smell.

[586] The District Director noted that the 2017 Hemmera Report considered potential air contaminants that were indicated during stack testing under the Approval. The stack testing under the Approval was required for that purpose and was mandated to test for a range of potential contaminants, including cadmium and lead. Under the 2020 Permit, thallium was added as a potential air contaminant to be tested for during future stack tests.

[587] The District Director noted that the 2017 Hemmera Report confirmed that downwash would be modelled as required. Downwash was discussed at section 5.3 of that report.

[588] The District Director says that nothing in Mr. McEwen's testimony should be relied upon to discuss the effectiveness of the temporary structure constructed to test emissions from ES02 in 2016, as Mr. McEwen was not qualified as an expert in stack testing.

Permit Compliance

[589] The District Director argues that Ebco's compliance with the Permit is not an issue under appeal. Additionally, the District Director says the appellants made a number of unfounded allegations of noncompliance against Ebco. Specifically, the District Director argues that there was no expert evidence to substantiate the release of hydrogen chloride from the Facility and no evidence of Stripping activities and downwash "saturating the air" with emissions. The District Director says the appellants failed to link their alleged symptoms or the alleged environmental harm to emissions from the Facility. Accordingly,

[16] The appellants also reference a page number in an exhibit corresponding to a complaint filed with Metro on November 7, 2020; however, there is no reference to sulphuric acid in that complaint. There are such references in subsequent complaints however, including on January 16, 25, and 27, 202; February 4 and 18, 2021; and February 16, 2022.

the District Director argues, the Board should reject the appellants' arguments on those points.

Emissions Testing

[590] The District Director disagrees with the appellants' assertion that continuous emissions monitoring is cost-effective. The District Director argues that the only evidence on this point came from Mr. Robb, who stated that such systems were prohibitively expensive and warranted only in the case of the biggest emitters within Metro's area of regulation.

Environmental Impacts

[591] In terms of impacts, the District Director says there has been no detectable trend of increasing nickel or zinc in surface water sampling to date. Furthermore, she argues that the appellants merely asserted, and provided no evidence to support, that the Facility's emissions cause acid rain or that there has been any impact associated with acid rain or the Facility.

[592] The District Director argues that there is no evidence to support a conclusion that there is contamination of soil or plant tissue attributable to the Facility. The District Director argues that elevated concentrations of nickel and zinc measured in a lawn drain are most likely related to the storage of galvanized items upgradient from the lawn drains on the Site. The District Director references Mr. Choi's evidence in support of these arguments.

[593] With respect to the appellants' argument that Mr. Choi relied on the air dispersion and deposition modelling for his analysis, the District Director argues that this is not the case. Mr. Choi relied on that data only when planning sampling locations to gather data for the soil, water, and plant tissue reports.

[594] The District Director also notes that the evidence does not support that the Facility creates hydrogen chloride, hydrochloric acid, and white sulphate salts (e.g., ammonium sulphate and zinc sulphate) because the evidence referenced was a press release discussing the Silver City Facility, before it operated with a permit. The District Director argues that it cannot be inferred that Ebco created the same emissions or contaminants.

[595] The District Director says there is no objective evidence to connect any of the complaints of local residents, including the foal miscarriages, to the Facility. The record of complaints has been admitted as truth of the fact that complaints were made, not the truth of the complaints themselves. Metro staff repeatedly followed up with, but were unable to detect, any alleged odours or emissions from the Facility, or to objectively track the alleged odours to the Facility. Similarly, Ebco had reported in 2022 that there were only two complainants since 2019 and, after investigating the complaints, Ebco found all of them to be misattributions.

[596] The District Director adds that no expert evidence was supplied by the appellants to corroborate or prove any claim of health impacts on humans or animals by emissions from the Facility. Furthermore, even to the extent that analytical results were produced, they do not describe toxic emissions but rather indicate there was no fetal intoxication nor traces of toxins in the placenta of the miscarried foal in that case. In any event, the District Director notes the pathologist and veterinarian involved in that analysis were not called as witnesses and did not have their comments tested by cross-examination. The District Director says the Board should put no weight on their reports.

[597] The District Director adds that the appellants did not provide evidence to support that any alteration or negative impact to the environment had occurred, with respect to the usefulness of the environment. Specifically, there was no evidence of impacts to the environment of salmonids in Erickson Creek and Twin Creek.

[598] With respect to *Don Tegart*, the District Director notes the extreme volume of complaints (rising from 250 in 2015 to 2,300 in 2016). Furthermore, the District Director noted that in *Don Tegart*, public complaints were corroborated by a report from Dillon Consulting and by "sniff test" findings by Metro.

[599] *GFL* involved 510 complaints in 2017 and 1,040 in 2018. By contrast, the District Director says the Facility attracted 28 complaints in 2018, 37 in 2019, 27 in 2020, 40 in 2021, and 9 in 2022. In this case, there have only been two unique complainants since 2019.

[600] Additionally, in the case of the Silver City Facility, Mr. Robb testified that community observations were corroborated by those of Metro officers and by photographic evidence clearly showing particulate emissions.

[601] For these reasons, the District Director argues that the findings of environmental impact in *Don Tegart*, in *GFL*, and in the Silver City investigation are all distinguishable from the circumstances of this case. The District Director argues that the allegations of environmental harm have not been connected to the Facility, and even if other compounds are being released from ES02 as the appellants allege (which the District Director says is unproven), that is not enough to conclude that pollution is occurring, as defined in the Bylaw.

[602] The District Director says that, if the Board considers it necessary, stack testing of ES02 could be undertaken while Stripping is underway to determine the nature of any emissions at that time. Metro could then assess whether such emissions are significant or warrant additional controls.

[603] With respect to the 2020 Permit amendment, however, the District Director relies on the testimony of Mr. Kemp, who stated that the changes associated with the 2020 Permit (in particular, the installation and use of ES01C, the construction of the Secondary Containment, and the FEMP) resulted in a greater capture of emissions from the hot dip galvanizing tank and fewer fugitive emissions.

Emissions Treatment

[604] With respect to emissions treatment, the District Director argues that the Board heard that ES02 emission treatment via a wet scrubber is unnecessary because alternative measures, which also fulfill BACT requirements, are used. Specifically, sulphuric acid is used instead of hydrochloric acid. Furthermore, tanks are kept at a lower temperature than in other galvanizing facilities, which keeps the acid more in a liquid phase. Lastly, bubbling of the acidic solution is minimized when Anti-Vapour is used. The District Director argued that Mr. Kemp testified that use of Anti-Vapour without any wet scrubber was BACT for the Facility, while a wet scrubber would also create a waste stream. The District Director also noted that Mr. Robb testified that it would be unusual for emissions treatment measures to be required for the release of ambient air from a working area in which workers are able to work without any personal protective equipment.

[605] The District Director also asks the Board to consider that the Silver City Facility's sulphuric acid emissions, post-emissions control, that exceed the 2016 measurements of ES02 at the Facility. The Silver City Facility's emissions also reportedly approach or exceed the maximum permit levels authorized in the Permit for sulphuric acid emissions from ES02.

[606] The District Director notes that it is beyond her jurisdiction to regulate emissions in a liquid phase from the Facility or the Site (such as stormwater).

Complaints and Investigations

[607] With respect to the complaints management system at Metro, the District Director argues that this process is outside of the Permit and is not something the Board should address. Regardless, the District Director argues that the complaint process is effective because:

- all complaints received by Metro were brought to the attention of Metro staff and Ebco;
- the process resulted in dialogue between Metro and Ebco concerning the subject matter of the complaints;
- Metro staff conducted site visits to follow up on complaints and inspect the Facility's emissions;
- the process likely prompted Ebco toward continuous improvement of Facility operations, as well as the capture and treatment of emissions; and
- raised, to Mr. Robb and staff, the possibility of fugitive emissions and resulted in the FEMP being required in the 2020 Permit amendment.

[608] The District Director also argues that complaints were not dismissed because of Mr. E. Eppich's assessment but because of Metro's independent assessment of wind data, which suggested that the Facility was unlikely to be the cause of complaints received. The

District Director adds that the evidence does not establish a connection between the complaints filed with Metro and the Facility. Although there are many complaints received from the nearby IronGait and Thielemann properties, this is not the effect of unpredicted downwash. Rather, Mr. McEwen accounted for downwash in his assessment and predicted negligible potential for adverse impacts. Mr. McEwen stated that downwash typically reduces windspeeds in a localized area, but only when windspeeds are within a certain range and when they are travelling in a certain orientation relative to a building.

[609] With respect to the appellants' submission that Metro does not want to investigate the Facility, the District Director says that this was not supported by any reference to Mr. Armstrong's testimony and, in any event, Mr. Armstrong has not worked at Metro (particularly as an officer) in many years and as such he has little knowledge of Metro's investigative capacity or its current investigatory objectives.

Expert Testimony for the Appellants

[610] The District Director says that the appellants did not provide any transcripts of Dr. Lanphear's testimony, so the appellants' summary of his testimony cannot be verified. The District Director argues these submissions should accordingly be rejected or treated with great caution.

[611] The District Director also disagrees with the appellants' assertions that rely on Mr. Oehr's evidence. Specifically, the District Director says that lead and cadmium are tested for under the Permit, and have been since 2018. The District Director says these measurements are, according to Dr. Preston, taken to ensure that concentrations of chemicals of concern do not reach the level of air contaminants and to ensure that they are regulated by a permit, where appropriate. Furthermore, the District Director notes that stack testing in June 2016, August 2018, October and November 2020, July 2021, and August 2022 has revealed cadmium concentrations one order of magnitude less than the Texas one-hour ambient threshold. The data referenced in support of that contention compares the one-hour sampling averages in those stack tests of ES01—0.53 µg/m^3—against the one-hour ambient air quality objective for Texas: 5.4 µg/m^3. The District Director added that those stack testing concentrations would be further mitigated by dispersion before reaching the ground.

[612] The District Director notes that the same is true of lead measurements, except for one measurement. The District Director says that Mr. Oehr's analysis of lead impacts is based entirely and unreasonably on that single measurement, ignoring the others. Furthermore, the District Director says that Mr. Oehr was not qualified as an expert in the toxicology of lead and cadmium and, therefore, any evidence he provided as to the alleged effects of those elements on human health should be disregarded as beyond his expertise.

[613] With respect to mass balancing, the District Director argues that it is not feasible to compare the tonnes per year of materials used in work at the Facility to the emissions,

measured in µgs (micrograms). The District Director adds that it is unclear how accurately one could measure the difference in weight of a piece of steel, before and after it is galvanized.

Conclusion

[614] The District Director argues, in conclusion, that if the 2020 amendment to the Permit were reversed, the original Permit's terms would apply to the Facility. Furthermore, the District Director argues that, as stated in *Don Tegart*, a permit should not be reversed unless there is no way to revise it to cure its defects. Furthermore, each term of a permit must be lawful, within the jurisdiction of the legislation, reasonable, and not based on irrelevant or erroneous considerations. The District Director says the appellants have not met their evidentiary burden to establish that any appealed version of the Permit is not sufficiently protective of human health or the environment.

Ebco's Submissions

[615] Ebco argues that the appellants have failed to meet their burden of proof, to show that the Permit (in its various versions) is insufficiently protective of human health and the environment. Ebco says the Permit (in its various versions) was issued after comprehensive processes, rigorously undertaken by knowledgeable staff at Metro, with input from the public and other agencies. Ebco says the Board should confirm the appealed versions of the Permit and dismiss these appeals.

[616] With respect to the appeals of the 2019 Permit in particular, Ebco says the appellants did not make any arguments about those appeals during their submissions and Ebco considers those appeals to accordingly be abandoned. Otherwise, Ebco says that the appellants bear the burden of proof to demonstrate that the 2018 Permit and 2020 Permit are insufficiently protective of human health or the environment. Ebco agrees that the Board should take a "cautious and technically rigorous approach" when assessing this question, as described in *John Pickford v. Director, Environmental Management Act*, 2019 BCEAB 6 (CanLII) (*Pickford*). Ebco says, however, this is not equivalent to a zero-tolerance approach, as noted in *GFL*. Furthermore, as noted in *GFL*, the Board must grapple with the issue under appeal in a way that is scientifically sound, as described in *GFL*.

[617] Ebco also references *GFL* to say that the Board must also require the appellants to provide "… persuasive evidence, such as scientifically established evidence, that permitted emissions" have caused or could cause adverse effects on human health or the environment.[17] Ebco says that the Board may rely on "expert evidence, properly adduced and subject to cross-examination rather than on anecdotal evidence based on beliefs,

[17] Para. 682.

however genuinely held."[18] Ebco argues it is not enough to raise concerns and questions about permit terms: the appellants must provide scientifically sound evidence that raises doubt about the terms of the Permit.[19] Proposed permit terms which are not grounded in science or law are not protective of the environment and should not be required in a permit.[20]

[618] Similarly, insofar as the appellants argue that the Facility causes pollution on the balance of probabilities—that the Permit results in the release of substances or contaminants that substantially alter or impair the usefulness of the environment—Ebco argues that the appellants have not met their burden of proof.

[619] Ebco says that, while the Board does not owe deference to the District Director, where there are significant volumes of evidence, some of which was before the decision-maker, the hearing process is best described as "hybrid," meaning that the record before the decision-maker is also considered by the Board.[21]

[620] With respect to ES01, Ebco argues that the Permit is adequately protective of human health and the environment. Emissions are captured and routed through BACT baghouses, pre-treated with powder to maximize their performance. The FEMP protects against fugitive emissions. Stack testing is required every two years, following the stack measurement plan approved by Metro.

[621] Ebco says emissions from the facility, including zinc, particulate matter, and sulphuric acid, pose no realistic threat to the environment given their small qualities, both in absolute terms and when compared to other contaminant sources in the region. Ebco says that, although it does not have to prove it, the evidence indicates that the Facility causes no harm to human health and the environment. Ebco relies on the evidence from Mr. McEwen, Mr. Haley, Mr. Choi, and Mr. Tiplady in support of that argument.

[622] With respect to ES02, Ebco says the Permit requires Anti-Vapour and IronSave. These are considered BACT because they prevent or minimize sulphuric acid emissions from the Facility. No capture or treatment is required because there is not significant sulphuric acid being emitted from the Pickling Tank. The ambient room air is safe for employees to breathe and the Permit authorizes a concentration of sulphuric acid (0.055 mg/m^3). This concentration of sulphuric acid is less than the WorkSafeBC limit (0.2 mg/m^3) and less than concentration limits found in other similar permits in Metro, such as the permit for the Silver City Facility. Furthermore, the concentration of emissions is further reduced by dispersal before reaching the boundary of the Site or any receiving environments.

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[18] Para. 683.

[19] *Pickford* at para. 190, *GFL* at para. 680.

[20] *GFL* at para. 477–479.

[21] *GFL* at para. 308.

[623] Ebco says the Permit also requires the submission of soil, plant tissue, and water sampling reports every two years, consistent with the plan for such reports, approved by Metro.

Complaints Against the Facility

[624] Ebco says that, since 2019, the only complaints about the Facility have come from the households of four of the appellants. Ebco says that half of the complaints filed in 2021 were from when the Facility was not operating. This proportion increased to 70% in 2022, according to Ebco. Ebco argues that these complaints can therefore not be relied upon to establish any impacts on those complainants. Furthermore, Ebco says there is no expert evidence that relates any health effects asserted by the appellants to the Facility.

[625] With respect to ES02, Ebco argues that ambient air from the Facility is discharged into the environment. Ebco says that repeated tests from WorkSafeBC and MSABC have confirmed that this ambient air is considered safe for humans to directly inhale, for numerous continuous hours, without any protective equipment. Ebco argues this confirmation is inconsistent with reports of physical effects after dispersal in the environment, as described in complaints against the Facility, filed with Metro.

[626] Furthermore, Ebco says that it is diligent in its investigation of complaints. Where it concludes the Facility may be a cause of complaints, it discloses this to Metro and takes steps to remedy whatever circumstances were responsible. Whatever expertise the Board has, it must only consider evidence presented at the hearing.[22]

[627] Ebco says that, should the Board impose conditions for the protection of the environment that are different from those required by Metro, the Board retains supervisory jurisdiction over those conditions and must determine any requests to amend those conditions in first instance.[23]

[628] Ebco says the appellants failed to satisfy their burden of establishing that the Permit was not sufficiently protective of human health or the environment. Ebco addressed the evidence from the hearing in support of this argument.

Hydrogen Chloride Emissions and Acid Rain

[629] Ebco says the appellants' focus shifted over the course of the hearing, toward descriptions of the Facility's emissions as "white smoke" or "white clouds," which Ebco says the appellants only now try to relate to hydrogen chloride. Ebco says there is no evidence to support that hydrogen chloride is likely a contaminant causing the emissions to be

[22] *GFL* at para. 675.

[23] Section 15 of the Bylaw.

white, or that hydrogen chloride is the likely source of the odour and taste identified in the evidence of the appellants.

[630] Ebco also notes that the appellants rely, in particular, on Stripping as a possible source of hydrogen chloride. Ebco responds that baghouse filters, which are cleaned with Flux and caustic soda, have nothing to do with Stripping or the use of sulphuric acid. Ebco agrees that Mr. E. Eppich discussed high hydrogen chloride levels, but the reference made by the appellants to this effect related to the presence of that substance in the bag houses, as noted in Mr. E. Eppich's testimony from August 16, 2023.

[631] Furthermore, Ebco says Stripping takes place at low-temperature in a tank containing a milder sulphuric acid solution than Pickling Solution, according to Mr. E. Eppich's testimony on June 9, 2023. Ebco adds that Mr. E. Eppich was asked directly if Stripping produces hydrogen chloride and he said that he did not know. In sum, Ebco says that the appellants' argument that Stripping involves a strong chemical reaction and releases a large volume of hydrogen gas is unsupported by the evidence.

[632] Further, Ebco says that even if any hydrogen chloride is produced, it does not necessarily follow that a permit is required for it: permits are only required if the amount of hydrogen chloride emitted is sufficient for it to amount to an air contaminant, as described in the Bylaw.

[633] Finally, Ebco says that, of the 141 complaints filed with Metro and alleged to be about the Facility, only three occurred while Stripping was underway. This does not support the conclusion that hydrogen chloride likely accounts for the bulk of the complaints against the Facility.

[634] Ebco argues that the position being advanced by the appellants would require expert evidence from multiple sources to substantiate. Material data safety sheets and fact sheets alone are insufficient to draw the conclusions advanced by the appellants, in particular any assertion that the Facility's emissions caused any symptoms in those who claim they were affected by the emissions.

[635] Ebco argues that the appellants' concerns about acid rain impacting the local environment, including farm productivity and crop health, are similarly unsupported by the evidence. As above, Ebco relies on the evidence of Mr. McEwen, referencing the air dispersion modelling done in this case, to argue that there are no expected adverse effects to human health or the environment arising from emissions from the Facility.

Ebco's Witnesses

[636] Ebco relies on the 2017 Air Dispersion Report, the 2020 Air Dispersion Report, and Mr. McEwen's testimony in arguing that the Permit (in its various iterations) is sufficiently protective of human health and the environment.

[637] Ebco also references Mr. McEwen's testimony about the layers of conservatism in the modelling exercise as a reason to conclude that the Permit is sufficiently protective of

human health and the environment. Ebco also noted one additional layer of conservatism not described by Mr. McEwen: with respect to the 2020 Air Dispersion Report, the model assumed the Facility was operating continuously throughout the year, which exceeds even the operating hours under the Permit.

[638] With respect to Mr. Choi's testimony, Ebco argues that there is no expert evidence that disputes the adequacy of Envirochem's sampling plan or sampling methodology.

The Appellants' Lay Witnesses

[639] Ebco says the appellants have not all reported experiencing adverse effects from the Facility's emissions, let alone "prolonged adverse effects" as they have asserted. Ebco also takes issue with the credibility of some reports from the lay witnesses and with the question of causation: whether the Facility in fact caused the symptoms described by some of the appellants' lay witnesses.

[640] Furthermore, Ebco says that the appellants "concerns" are irrelevant and inadmissible in the context of these appeals. The appellants are lay witnesses and advocates whose concerns and subjective beliefs are not evidence that any of the Facility's emissions have caused, or are capable of causing, harm to human health or the environment. Such conclusions could only be drawn from evidence provided by objective, unbiased, and qualified experts, according to Ebco.

[641] Furthermore, to the extent that any appellants assert impacts to the health and comfort of people or animals because of the Facility's emissions, Ebco says that air dispersion modelling (discussed below) predicted no such impacts and there is no credible evidence to the contrary.

[642] With respect to Mr. Mueggenberg and Ms. Orringe's testimony specifically, Ebco says neither described any harm, discomfort, or health impacts, either to them or to their employees at IronGait, as a result of emissions from the Facility. Even if there was, however, there is no expert evidence to establish causation. Ebco adds that Ms. Orringe, contrary to the appellants' submission, did not describe any harmful effect on IronGait's farming operations (cattle program, horse breeding and training program, or rainbow trout aquaculture), or establish any connection between such harm and the Facility's emissions.

[643] With respect to the appellants' assertions about downwash, Ebco disagrees that downwash tends to disperse emissions in the direction of IronGait. Ebco says, instead, expert evidence from Mr. McEwen (discussed below) established that downwash affects microscale winds near the source, and the air dispersion modelling exercises accounted for this phenomenon. Ebco says there is no evidence that downwash would cause emissions from the Facility to specifically affect IronGait, hundreds of meters away. Ebco adds that, while the appellants have asserted there are localized weather patterns around IronGait, this was not established by any expert evidence.

[644] Ebco also disagrees with the appellants' submissions as they pertain to the foal miscarriages at IronGait. First, Ebco says the death of the foals would require expert evidence to determine and no such evidence on causation was provided. Veterinary and pathology reports are not admissible as opinion evidence in this appeal, as no expert testified as to the contents of those reports and there was no notice of expert testimony provided by the appellants, about those reports.

[645] Ebco says that, even on the face of those reports, they do not establish any causation. There is no report associated with the first foal death, in December 2018. The report in respect of the second death describes, as part of the case history, that IronGait reported an earlier foal death with "nothing suspicious … other than excessive twisting of the umbilical cord." Additionally, the report finds no toxins or metals in the foal's tissues. Specifically, liver studies showed zinc, lead, and nickel levels below detectable limits or within normal ranges. No specific cause for the death of the foal was identified. With respect to the third foal death in February 2020, a veterinarian stated test results for heavy metals and other toxins were unremarkable for toxicity, and attributed the death of the foal to general placentitis, which is a common cause of late miscarriage and premature death in horses.

[646] Ebco says that the lay evidence about wind direction around the time of the foals' deaths does not establish that the Facility's emissions are capable of, or were responsible for, the foals' deaths. Ebco relies on the air dispersion modelling (described in more detail below) to argue that maximum emission concentrations at IronGait would not cause harm to human health or the environment.

[647] With respect to the evidence from the Thielemanns, Ebco argues that it suffers from the same lack of expert evidence or persuasive evidence on causation. Ebco argues the air dispersion modelling and associated expert reports are more persuasive. Additionally, Ebco argues that the Thielemanns' complaints were made, at times, when the Facility was closed or not operating, meaning that their complaints on causation lack credibility. Furthermore, their reports of acidic odours, odours like rotten eggs, and of being unable to breathe, are not associated with emissions from the Facility, according to Mr. E. Eppich and according to the occupational health and safety and occupational hygiene information gathered at the Facility that support the conclusion that the ambient air in the Facility is safe for workers to breathe. Furthermore, Ebco asserts that the Thielemanns' credibility is negatively impacted by their persistence in complaining about Facility emissions after Ebco has presented evidence which it says demonstrates that the Facility was often not operating and, consequently, the Facility's emissions are not a probable cause of their reported symptoms.

[648] While Mrs. Thielemann says the Facility's emissions killed two of her dogs, Ebco says there is no evidence, expert or otherwise, to support that bald allegation. While Mr. Thielemann blames the Facility's emissions for Mrs. Thielemann having to leave their home on the advice of her physician, Ebco says this is hearsay evidence (or double hearsay) and inadmissible opinion evidence. Any opinion about the cause of Mrs.

Thielemann's medical conditions requires unbiased, appropriately qualified, expert evidence.

[649] Insofar as the Thielemanns rely on the information they described to Dr. McFadden, the Thielemanns' representative, Ebco says that the associated record is prejudicial, unreliable, and inadmissible hearsay evidence. Ebco says the Board should only consider the evidence given by the Thielemanns directly during the hearing, as Dr. McFadden was not a witness at the hearing, was working as the Thielemann's advocate, and was not qualified as an expert witness in the proceeding.

[650] Lastly, Ebco argues that photographs about clouds of gaseous emissions emanating from the Facility do not support any particular conclusion, as water vapour is expected to be emitted from the Facility and is allowed under the Permit. Ebco says that photographs of clouds or vapour in other areas could be fog or, even if they represent emissions from the Facility, could be water vapour as authorized under the Permit.

[651] With respect to Ms. Kroecher's concerns about property values, Ebco argues that any change in property value is not relevant: the issue before the Board is whether the Permit is adequately protective of the environment. Ebco adds that Ms. Kroecher did not provide any expert evidence about the value of her home being impacted by the Facility.

[652] Ebco further notes that Ms. Kroecher did not provide testimony that she had noticed any impact to her property since the Facility began operating. To the extent that she relies on a photograph of emissions at the Facility, Ebco argues that those emissions may simply depict water vapour that may be released under the Permit.

[653] Insofar as Ms. Kroecher reported a headache and shivering while near the Facility in April 2018, Ebco says this is an isolated incident, for which there is no evidence that these symptoms were caused, or even capable of being caused, by the Facility's emissions. Ms. Kroecher's evidence is also inconsistent with the evidence that workers are able to safely work within the Facility without any impacts to their health and safety.

[654] Lastly, Ebco says Ms. Kroecher's concerns about contamination of the Brookswood Aquifer are not supported by any expert evidence and, furthermore, are dispelled by the expert evidence of Mr. Choi and Mr. Tiplady.

The Appellants' Experts

[655] Ebco argues that the expert evidence relied upon by the appellants is either equivocal as to whether the 2018 Permit and 2020 Permit are adequately protective of human health and the environment, or in the case of Mr. Oehr, unreliable. Ebco says that the evidence of Mr. Armstrong, Dr. Bolton, and Dr. Lanphear were abstract and in relation to their specific areas of expertise. None suggested that the emissions from the Facility would likely result in an adverse impact to human health or the environment.

[656] Ebco says the appellants, in discussing the evidence of their experts, advance factual assertions not supported by the evidence and otherwise misrepresent the

evidence before the Board. Ebco says the appellants advance speculative theories for which there is no evidentiary basis and make references to transcripts that do not support the arguments which purportedly rely on those references. Furthermore, Ebco argues that the Appellants often referenced only a witness' testimony generally, or referenced multiple days of testimony, which Ebco says is abusive: this practice conceals misrepresentations of the evidence from the Board and renders the associated submissions unreliable.

[657] With respect to Mr. Armstrong specifically, Ebco says he had resiled from an earlier position espoused in 2016: the Facility's emissions will cause serious harm to aquatic life in the area. Ebco says that Mr. Armstrong expressly stated he did not offer the opinion that the Facility was causing any adverse effects; he stated there was a potential for such effects and a need for monitoring. Ebco says Mr. Armstrong's evidence is insufficient to support a finding that the Facility's emissions will have a negative impact on the salmonids inhabiting nearby waterways nearby or that the Permit is not adequately protective of human health or the environment.

[658] With respect to Mr. Oehr specifically, Ebco says that the Board should not rely on his expertise in chemical engineering in respect of any potential impacts from the Facility, as his knowledge with respect to hot dip galvanizing and the relevant processes is virtually non-existent. Ebco says Mr. Oehr "essentially learned as he went on this file."

[659] Ebco says that Mr. Oehr advanced bold conclusions without qualification or justification. His conclusions were, according to Ebco, made without regard for whether they should be appropriately qualified or if they were in the appropriate context. Ebco argues Mr. Oehr attempted to fit the data to his hypotheses, rather than approaching the data impartially. Ebco says Mr. Oehr was not credible and lacked candour. Ebco says, even if the weaknesses in Mr. Oehr's opinions resulted from innocent mistakes, this is still relevant to the weight to be given to the opinion.

[660] Ebco argues that Mr. Oehr has a demonstrated history of using hyperbolic and unsupported claims to "flag" issues for regulators to consider. Specifically, Ebco references a 2017 submission Mr. Oehr wrote to Mr. Robb, describing a 2,000-fold exceedance of applicable Canadian PM2.5 limits and a 100-fold exceedance of Ontario's ambient air quality guidelines for zinc as a result of emissions from the Facility.

[661] Mr. Oehr's analysis with respect to PM2.5 was based on Mr. Oehr calculating the capacity of the environment to accommodate additional PM2.5 while adhering to the most stringent Canadian ambient air quality standards for 24-hour exposure: 10 $\mu g/m^3$. Subtracting for PM2.5 from the nearest Metro monitoring station, Mr. Oehr determined that the absorbing capacity was 3.9 $\mu g/m^3$, which would be exceeded based on the concentration requested for the Permit, given that the average particle size of "fume emissions from a zinc galvanizing kettle" was 2 microns.

[662] With respect to zinc, Mr. Oehr calculated the requested zinc discharges, 10mg/m^3, as being equivalent to a 12.5 mg/m^3 concentration of zinc oxide, based on the ratio of

their atomic weights. Mr. Oehr stated that the maximum exposure level for zinc according to the National Institute for Occupational Safety and Health was 5 mg/m^3 and it was inappropriate to authorize a concentration more than twice that amount, and more than ten times Ontario's ambient air quality standards.

[663] Mr. Oehr explained in cross-examination that those statements were made with little understanding about the Facility and based on publicly available data on the effectiveness of the baghouses at the Facility. Mr. Oehr assumed that the environmental concentrations of PM2.5 and zinc would equal those present at the stack (ignoring dispersion effects). Mr. Oehr then stated that he flagged the emissions because he "had no way of knowing what the dilution factor is to the ground." He stated that, if he did not flag it, he did not think anyone would pay attention to the issue.

[664] Ebco argues that Mr. Oehr's opinions given in the hearing suffered from similar hyperbole, based on presumed equivalence between ratios from one stack test measurement to deposition rates over time, without regard for the sensitivity of low numbers to such analyses. Furthermore, Ebco critiques Mr. Oehr for presuming a linear fit between air concentrations and increasing soil concentrations for metal contaminants. Mr. Oehr did not verify these assumptions.

[665] Ebco also critiques Mr. Oehr not considering sampling data because, as Mr. Oehr stated, he "was looking for an effect, and [he] got an effect" based on his consideration of one number. Mr. Oehr added, "I got what I was looking for. I was trying to figure out whether ammonia was an issue, and it looks like it's a flag … based on the calculations I did with the Hemmera ratios suggests that ammonia could be an issue."

[666] Ebco says these analyses were based on plotting graphs and linear regression "curves" based on coefficients derived by software, all while omitting critical data points inconsistent with his hypothesis.

2020 Permit Amendment

[667] Ebco asserts that Mr. Robb had been aware of the potential for fugitive emissions from the Facility but did not think he could require an amendment of the Permit to address that concern because doing so would not be necessary for the protection of the environment. Ebco references the following testimony from Mr. Robb on February 7, 2020:

> I can amend [the Permit] on my own initiative if I consider it necessary. That is a tough test. I can, you know, if I have evidence beyond a reasonable doubt, issue—or not I, but staff can issue tickets, or we can do prosecutions. Again, very high bar. And the evidence I've seen to date would not put me in a position that I could advance such a case.

[668] Ebco says that the principal change with the 2020 Permit was adding ES01C, increasing the capture efficiency and treatment of emissions from the Kettle. This reduced fugitive emissions and improved the Permit's protection of human health and the

environment. Additionally, the addition of a limit for hydrochloric acid did not have a significant, or any, impact on the environment. When enacted, the Permit's limit for hydrochloric acid was the lowest in the Metro region.

Appellants' Reply

[669] The appellants say, from a general perspective, that they lack the resources of Ebco and Metro. They have purchased transcripts from the proceeding where possible but cannot afford to purchase transcripts over the whole of it. They say they should not be required to purchase transcripts, as this would impose an unreasonably high standard on them, and would run contrary to the intent of the *Act* and the *Administrative Tribunals Act* and the principle of access to justice. As laypeople, they may have been less familiar with in-hearing requirements for evidence, procedure, and cross-examination. They say they were honest and faithful to the evidence in the absence of transcripts they could not afford.

[670] Specifically with respect to Mr. Armstrong's evidence, the appellants note several instances where he talks about potential effects of metals (and zinc in particular) on fish health, and about toxic effects associated with zinc exposure in general. They say that Ebco mischaracterised his evidence on those points.

Evidence on Stripping

[671] The appellants reply that they were unaware of Stripping and baghouse filter cleaning in the pre-treatment area until Mr. E. Eppich's testimony on June 9, 2023. The appellants say that this process releases hydrogen chloride in the pre-treatment area. That gas then escapes through ES02 and represents a form of air contaminant not considered by the District Director when issuing and amending the Permit. No containment or mitigation measures have been contemplated or introduced.

[672] The appellants say that their lack of notice about this process prevented them from calling witnesses and adducing evidence on this process, the release of hydrogen chloride from the Facility, and associated harms to human health and the environment. The appellants also argue that, by failing to disclose this process to the District Director, Ebco breached the Permit (both 2018 and 2020 versions) which requires reasonable notice of, and the District Director's approval of, changes to procedures or sources of air contaminants.

BACT

[673] On the question of BACT, the appellants argue that the Board should interpret the term with the purpose of the *Act* in mind: to prevent detrimental environmental impacts, as set out in section 2(2). The appellants say that the use of additives in the Pickling Tank does not eliminate emissions from ES02 (as acknowledged by the District Director) and

that, when Mr. Kemp assessed BACT, he did so only from the perspective of particulate matter and acid, not additional contaminants released during Stripping. This makes his recommendation unreliable, according to the appellants.

[674] Furthermore, the appellants say the District Director failed to explain why, even with his assessment of BACT, a wet scrubber would be required in the Silver City Facility but not in the Facility. Given the lack of a scrubber, the appellants argue the Permit is less protective of human health and the environment than the permit in place for the Silver City Facility. The appellants say the District Director must impose "technologies used in other commercial operations (such as Wet Scrubbers)" on the Facility. Furthermore, a plain reading of BACT suggests that an additional emission control requirement offering a superior level of environmental protection ought to be required because it is better than the alternative of not having that emission control requirement.

[675] Insofar as the District Director and Ebco have argued that Silver City's sulphuric acid emissions are greater than Ebco's actual or permitted emissions, the appellants say this is based on one stack test of ES02 undertaken before the plant was in commercial operations, in 2016, and this is not an adequate basis for comparison.

The Witness' Complaints

[676] With respect to their complaints, the appellants say that the Board does not need to rely on expert evidence to make findings in an appeal. The Board may rely on the observations of lay people. The appellants say that finding their testimony not reliable, credible, or admissible would impose an unreasonably high evidentiary standard that impedes access to a cost-effective and accessible appeal process that the Legislature intended when it granted the Board jurisdiction over appeals made under the *Act*. The appellants say they have financial limitations and cannot produce expert evidence with the same ability as Ebco and Metro.

[677] Furthermore, the appellants argue that their evidence, as well as the available expert evidence, is enough to conclude that the 2018 Permit and 2020 Permit are not sufficiently protective of human health and the environment. The appellants say the same evidence supports a finding that that unauthorized emissions from the Facility, in particular from ES02, have substantially altered and negatively affected the usefulness of their environment.

[678] The appellants say that the District Director and Ebco's comments on the number of complaints and complainants cannot fairly be compared to odour sources as in *Don Tegert* and *GFL*. Emissions from a galvanizing facility are more toxic, the appellants argue, even if less dispersed geographically. Population densities may be different in each case as well. In any event, the appellants say that pollution impacting even one person is sufficient for the appellants to succeed in their appeal and a reversal or amendment of the Permit.

[679] The appellants say that Metro staff may not have confirmed pollution because the process responsible—mostly Stripping, according to the appellants—would have completed by the time Metro officers arrived. The appellants say that the impacts described by the Thielemanns are consistent with one another and with reports associated with historical emissions from the Silver City Facility.

[680] With respect to Ebco's investigation of complaints, the appellants say they have presented their own evidence and do not accept that Mr. E. Eppich's determinations of wind speed and meteorological conditions are determinative. Additionally, they argue that Mr. E. Eppich provided no corroborating evidence about Facility closures or activities and those comments should be disregarded.

[681] In any event, they note that Mr. E. Eppich stated that the fans in ES02 continue running even when the Facility is closed so emissions continue during those times. They say that their complaints should not be dismissed simply because the Facility was closed at the time. The appellants say the differences between water vapour and emissions bearing contaminants may not be apparent based on sight. They also say that, while the District Director considered that their complaints may have motivated Ebco toward improving Facility operations and the capture and treatment of emissions, Ebco will lack ongoing incentive to improve Facility operations without higher standards being mandated in the Permit.

Fugitive Emissions from ES02

[682] Given the District Director's "concession" that stack testing of ES02 would allow Metro to ascertain the nature and character of emissions associated with Stripping, the appellants ask the Board to amend the Permit to require stack tests of ES02 at least once every twelve months. The appellants note that there is evidence of fugitive emissions from that source. That evidence includes brown staining on the roof near the vents, on the walls within the Facility, on the ceiling fans in ES02, and on the tarmac immediately northwest of the Facility.

[683] The appellants say the FEMP is inadequate and must include greater regulatory controls, including ES02 testing and installation of wet scrubbers at ES02. Regarding historical testing at ES02, the appellants say no expert testified as to the adequacy of that test. The appellants also argue that Mr. McEwen did not provide sufficient evidence to allow the panel to rely on his opinion, that testing and other protections established under the 2018 and 2020 versions of the Permit were adequate.

[684] Furthermore, the appellants state that the testing was concerning because only one of six operating vents were tested, the testing occurred above the caustic tank and not the Pickling Tank, the test was based on production levels from Ebco's Richmond facility and does not reflect production at the Facility, the test was only for sulphuric acid, and Stripping was not underway during testing. The appellants say that, for these reasons, operations during stack testing of ES02 were not representative of normal operations. The

appellants say this undermined the subsequent air dispersion modelling which Mr. McEwen stated assumed activities during stack testing were "somewhat representative" of normal operations at the Facility.

[685] The appellants say that Ebco acknowledged, in closing submissions at paragraph 52, that 15% of the product galvanized in the Facility up to 2020 resulted in the release of fugitive emissions.

Excessive Ammonia Emissions at ES01

[686] The appellants argue that the emissions during the stack testing in October 2020 may have been done during a time of above-average production, but Mr. E. Eppich's testimony indicates that production weights per dip are highly variable, ranging from 500 to 20,000 pounds, with an average of 4,000 to 5,000 pounds and a high of 25,000 pounds. The appellants say that this production is not an outlier but falls within the variable range of production at the Facility and would be captured by more rigorous stack testing requirements in the Permit. The appellants say that the variability in production at the Facility, coupled with evidence of a Permit exceedance during high production phases, supports the conclusion that the Permit is inadequately protective of human health and the environment and should be rescinded or varied.

Hydrochloric Acid Emissions

[687] The appellants say that Ebco acknowledged hydrochloric acid emissions in its closing submissions, at paragraphs 29 and 72, and that the 2020 version of the Permit provides a limit for that substance. The appellants add that the FEMP requirement in the 2020 Permit demonstrates that fugitive emissions remain an issue. This all supports their argument that hydrochloric acid emissions are ongoing. The appellants argue their experiences, as expressed through the complaints they have filed with Metro about the Facility, similarly support this contention. The appellants say the symptoms described in those complaints are consistent with information on exposure contained in the Hydrogen Chloride Safety Data Sheet E-4606, which notes toxicity and corrosiveness when inhaled, as well as skin burns and eye damage with direct exposure. The appellants also argue that these complaints are consistent with the Hazardous Substance Fact sheet provided to the Board, which notes hydrogen chloride can irritate and burn the skin, eyes, nose, throat, and lungs.

[688] The appellants say that Mr. E. Eppich admitted the chemical reaction associated with cleaning baghouse filters is different from that of sulphuric acid, and that emissions from Stripping were not regulated under the Permit. They also say Mr. E. Eppich admitted that Stripping has not always been done at low temperature.

Allegations of Pollution

[689] The appellants say that the Board's reasoning from *Don Tegert*, at paragraph 274, is applicable in this case: the Board should find that pollution has occurred based on the experiential evidence of the appellants, exhibits tendered during the hearing, and expert evidence. The appellants argue that this all supports that, from time to time, emissions from the Facility have been highly offensive and have substantially altered and negatively affected the usefulness of the appellants' environment. That this is described most by four appellants in particular (those at the IronGait property and the Thielemann property) does not weaken this argument, the appellants say.

[690] The appellants add that the District Director's concession that stack testing of ES02 could be warranted to determine air emissions associated with Stripping further reinforces this argument. The appellants argue that this evidence of pollution must be addressed, at a minimum, by requiring stack testing at ES02 and mandating the use of a wet scrubber to treat emissions from ES02.

Air Dispersion Modelling

[691] The appellants say that, contrary to the submissions from Metro and Ebco, Mr. McEwen acknowledged that a plume of contaminants from ES01C was not included in the modelling that led to the 2017 Air Dispersion Report.

[692] Furthermore, he described downwash at the Facility when wind is blowing to the west: increased turbulence and low pressure would spread plumes of contaminants and bring some of the plume closer to the ground. As such a plume would continue to migrate westward, reaching forested terrain, where there would be more turbulence and mixing of the plumes.

[693] Mr. McEwen also acknowledged that the first receptors modelled for were at the Site's property boundary, so any effects closer to the building were not modelled for.

Protections for Soil, Plant Tissue, and Water Quality

[694] The appellants note that all parties acknowledge elevated zinc and nickel concentrations in water samples taken from some lawn drains at the Site, and the possibility that air emissions may be a contributing factor in these concentrations. The appellants welcome additional testing to measure this phenomenon but say that more stringent monitoring and protections are necessary, particularly given the lack of any regulated standards for metal concentrations in plant tissue. Furthermore, the appellants dispute Mr. Choi's evidence that revegetation of the bioswales will remedy the deficiencies in the lawn drains at the Site, which impede accurate monitoring of runoff.

Balancing of Interests

[695] The appellants say that the 2018 and 2020 versions of the Permit do not adequately balance the public interest against Ebco's interests, insofar as they do not provide sufficient protection for human health and the environment. The appellants are also concerned that the 2020 Permit was amended on Ebco's initiative rather than on Metro's, insofar as upholding the public interest is concerned. The appellants say reversing or varying the 2018 Permit and 2020 Permit would restore the proper balance of Ebco's interests, the public interest, and the appellant's interests.

Additional Submissions

[696] Ebco sought to file a sur-reply in respect of the appellant's submissions. Metro did not. In response, the appellants sought to file a sur-sur-reply. These submissions address the Rule in *Browne v. Dunn*, (1893), 6 R. 67 (H.L.), 1893 CanLII 65 (FOREP) and whether it applies to the appellant's argument about the uncorroborated nature of Mr. E. Eppich's testimony about whether the Facility was operating when various public complaints were filed with Metro. The panel did not need to address that rule for the reasons that follow, so has not considered the sur-reply or sur-sur-reply.

REASONS AND ANALYSIS

Introduction

[697] At the outset, the panel considers it appropriate to address general considerations that have affected its decision in this case.

[698] The appellants quoted from *Tegart*, where the panel stated that air contaminants should only be authorized where they can be "… properly controlled, ameliorated and, to the extent possible, eliminated." The extent to which this is done is a matter of proportionality: "properly" in this context indicates that emissions should be controlled, ameliorated, and eliminated to the appropriate extent, to appropriately balance "the risk of harm to human health and the environment … against the potential benefits of the activity and other societal interests," as described in *Bettner*.

[699] In addressing this tension, the Board should take a cautious, technically rigorous, and scientifically sound approach but must still bear in mind that it is the appellants in any appeal that bear the burden of proof. They must establish any alleged shortcomings in a permit and justify, on the balance of probabilities and with evidence and argument, what the Board should do about those shortcomings.

[700] In issuing the various iterations of the Permit under appeal, Mr. Robb grappled with this fundamental issue as well. His testimony described how he recognised and weighed competing interests in the issuance or refusal to issue the Permit, including the

public interest in improving air quality over time, and gauging whether the control, amelioration, and elimination of air contaminants which were proposed to be emitted was adequate. The Board does not owe the District Director any deference in weighing these questions.

[701] Mr. Robb explained this weighing process in greater detail, saying he considered the specific environment into which air contaminants were to be discharged and, in particular, how many people would likely be affected. He also discussed the importance of using commercially viable BACT to control, ameliorate, and, to the extent possible, eliminate emissions, but to not require emissions control technology beyond BACT. He also discussed the need for consistency between permits, while striving for continuous and incremental tightening of permit terms so that air quality in Metro would continually improve.

[702] The Board must also consider the fairness in the process. If the Board concludes there has been any unfairness, it will also consider how to remedy it, if that unfairness can be remedied. Generally, any unfairness in the process leading to the granting of a permit can be remedied by providing a fair process on appeal.

[703] The panel considers Mr. Robb's approach to be generally sound. With respect to the Permit specifically, he sought to make it specific and enforceable. He was more concerned with the impacts to human health and the environment through the reduction of fugitive emissions than theoretical emission levels that, in his opinion, would not be reached. The panel wishes to add that this is an approach it agrees with, with the caveat that those theoretical emission levels should be conservative and well-founded in the evidence. Mr. Robb also approved terms of the Permit he did not think were strictly necessary, provided Ebco was willing to agree to them. The panel considers this appropriate.

[704] The appellants argue that in this case, the balancing of interests was improperly done. They say the Permit is insufficiently protective of human health and the environment. This decision will address that argument in greater detail below. There are other arguments, however, to which a quicker reply can be given.

[705] First, the panel will address the merits of the Permit and is unconcerned with who sought to amend the Permit, as the Permit was validly issued and amended under the required legal authority. The panel will consider the Permit, as it stands currently, and decide whether to confirm, rescind, or vary the currently-in-force aspects of each iteration that have been appealed to the Board based on those merits.

[706] Second and finally, the panel disagrees that there is any jurisdictional uncertainty in this case. Metro was responsible for addressing the release of air contaminants into the environment from the Facility. It was not responsible for the presence of potential contaminants within the Facility, in stormwater or run-off, or for any other forms of waste. The panel has constrained its decision accordingly, as this decision's scope must mirror the jurisdictional limits of the District Director in issuing the Permit.

[707] The panel turns now to consider the specific relief sought by the appellants.

Remedies Sought and Questions to Address

[708] The appellants seek numerous remedies with respect to these appeals. Their primary position is that the Permit is fundamentally flawed and cannot be varied to sufficiently protect the environment against the risks and damages posed by the Facility. The appellants point to:

- Ebco's reported incidents of noncompliance with the Permit;
- Ebco's discharge of non-permitted chemicals (cadmium and lead specifically) into the environment;
- Ebco and Metro's unresponsiveness to complaints from the public;
- the lack of BACT at the Facility—specifically a wet scrubber; and
- inadequacies in monitoring, testing, reporting, and modelling of emissions and their impacts.

[709] As an alternative, the appellants ask the Board to vary elements of the Permit to:

- require a wet scrubber, as BACT, for ES02, along particular terms;
- increase the monitoring of emissions and environmental impact from the Facility in various ways;
- introduce concentration limits for cadmium and lead from ES01;
- require weather-monitoring equipment to be installed, upkept, and used at the Site;
- require a BACT assessment plan on an earlier timeframe; and
- shorten its duration.

[710] As a further alternative, the appellants ask the Board to refer the Permit back to the District Director with instructions to consider the variations to the Permit that the appellants sought (in some cases, with specific evidentiary and assessment criteria mandated to be considered), and to consider whether further air quality monitoring is required.

[711] Whether the appellants have established the appropriateness of any of their requested remedies accordingly depends on the answers to the issues they raised in justifying those remedies. The issues for the panel to address specifically are:

- When was Ebco noncompliant with the requirements of Permit?
- Does the Facility discharge air contaminants into the environment contrary to the *Act*, the Bylaw, and the Permit?

- To what extent are Ebco and Metro unresponsive to public complaints about the Facility?
- Does the Facility use BACT to mitigate the release of air contaminants?
- Are the monitoring (including weather monitoring), testing, reporting, and modelling requirements in the Permit sufficiently protective of the environment?
- Is the duration of the Permit too long?

[712] There are specific sources of evidence that inform several of these questions, and which merit consideration early in the panel's analysis. The panel considers these factual questions first, before the questions of mixed fact and law listed above are addressed.

Procedural Finding

Transcripts and Summaries of Testimony

[713] Ebco argued that the Appellants inaccurately summarized the evidence of some witnesses and stated the panel should treat their arguments cautiously as a result. Ebco says that it would have been better if the appellants provided transcripts of testimony with specific pinpointing in support of their summaries of witness testimony. Without such pinpointing, Ebco argues, the panel should be particularly cautious of the appellants' submissions because of the inaccuracies described above.

[714] The panel agrees that transcripts with pinpointed, direct quotations are best, where available. Such references are not always practically available, however. The panel takes careful notes during the hearing and verifies submissions made by the parties against those notes. Where the panel has noted inaccuracies in the summaries of testimony provided by the appellants, we have said so. The panel is not willing to draw inferences against the remainder of the appellants' submissions, however. We are not concerned that there was any intentional misstatement of witness testimony. We are also concerned about the fairness and accessibility of the Board's processes if the panel were to subject the submissions of some parties to greater scrutiny because they lack the resources to provide transcripts with pinpointed references.

General Factual Findings

Representativeness of Stack Testing

[715] All parties acknowledge that the Facility's variable production means that the quantity and type of emissions it produces likewise varies. This is the reason why Ebco is required to submit 90 days of production information to Metro before a Stack Test and underlies why Ebco and Metro have determined that some complaints filed against the

Facility are misattributions. The nature and extent of emissions results from the activities underway in the Facility at a given point in time.

[716] The 2016 Stack Test was crucial to establishing the terms of the Permit. Not only did it offer baseline information for the discharge of air contaminants at ES02, but it also defined emissions from ES01 that were associated with "normal operations," both for setting the terms of the Permit for ES01 and for completing the Air Dispersion Model Report and the Impact Assessment. Those, in turn, have been instrumental in Metro's decision-making with respect to the Permit. Separate from the reliability of air dispersion modelling generally, how representative the data gathered from the 2016 Stack Test is of vital importance to this appeal.

[717] In the oral hearing, how representative the 2016 Stack Test was of the Facility's general operations was called into question by two key factors: the weight of steel Galvanized during the Stack Test and the variability of surface area to weight for the steel that was Galvanized.

[718] The weights dipped for the 2016 Stack Test range from 1,428 to 1,640 pounds per test, with an average per shift of roughly 13,951 pounds. This was significantly less than the average per-shift weights dipped for Stack Tests in 2018: 31,526 pounds. Ebco did not argue that these weights were unusual, yet they were more than twice the weight dipped than in the 2016 Stack Test.

[719] It is unclear how much steel was dipped for the August 2020 Stack Test; however, Ebco has explained its means of calculation for weights and has provided its production data used in calculating the weight of steel dipped during the August 2020 Stack Test. Ebco says it determined its typical production weight by dividing the gross weight of steel galvanized over 90 days, dividing that amount by the number of shifts and then by eight to calculate an hourly rate.

[720] As a general proposition, the panel finds this methodology is not appropriate. While the details will vary based on the spread of the weights in the set, the panel is not satisfied that calculation of a mean value and adding a 10% safety factor will capture many of the periods of higher production. It will, at best, determine that, most of the time, the Facility's level of production will be equal to or less than the production measured by any given Stack Test. It does not, however, allow for an understanding of the weight of steel dipped at any specific point in time.

[721] To illustrate, the production records Ebco used to determine the Galvanizing to be done during the August 2020 Stack Test have a per-shift range from 9,294 pounds to 65,239 pounds. The total amount dipped over those 90 days was 3,236,716 pounds. This was spread out over 106 shifts, for a per-shift average of roughly 30,535 pounds. Even factoring in a 10% safety factor, Ebco's method of calculating its average production level results in a per-shift production level of roughly 33,589 pounds. This is lower than the per-shift production weights provided for 34 of the 106 shifts during the 90-day period preceding the August 2020 Stack Test, roughly one-third of the shifts.

[722] This problem is potentially compounded by the fact that Mr. E. Eppich described dividing the average weight dipped per shift by eight to arrive at an hourly rate of Galvanizing, expressed as pounds per hour. This timeframe more or less approximates the length of a Stack Test measurement. Production records indicate that Galvanizing does not occur uniformly across a shift, so computing an average hourly rate ignores the fact that, where there is Galvanizing going on during a shift, it will occur predominantly over discrete periods of time within the shift. Taking an hourly average spreads the weight Galvanized over the shift, and as a result the emissions generated from Galvanizing over the shift. This does not match the reality of operations.

[723] For example, the per-hour Galvanizing rate which Mr. E. Eppich testified was used to calculate dip weights for Stack Testing yields a rate of roughly 3,817 pounds per hour. Even with the 10% safety factor, the hourly rate is 4,199 pounds. The panel has limited information about dip times from when Ebco was operating at the Facility, under the Permit (as opposed to production records from 2016, when Galvanizing at the Facility was done for the limited purposes allowed under the Authorization). The available production information from the Facility during the life of the Permit spans five shifts. Those records provide the following information about the weight of material Galvanized when galvanizing took place:

Shift	Weight Galvanized	Time Galvanizing	Average
January 3, 2019, AM	23,656 pounds	2.37 hours	9,981 pounds/hr
January 3, 2019, AM	10,400 pounds	0.67 hours	15,522 pounds/hr
February 11, 2019, AM	23,672 pounds	2.00 hours	11,836 pounds/hr
February 12, 2019, AM	16,898 pounds	1.17 hours	14,443 pounds/hr
February 12, 2019, PM	10,624 pounds	1.58 hours	6,724 pounds/hr

[724] The panel understands these figures are not perfect. It takes time for the Smoke to be evacuated from the Kettle and discharged from ES01. The panel considers this a closer approximation than averaging over the whole length of a shift, however, as the evidence establishes that few emissions will be produced by the Galvanizing Tank when there is not Galvanizing (including reactions between the Alloy and Flux) taking place. This information is useful to illustrate deficiencies in the 2016 Stack Test data.

[725] By comparison to the above, the 2016 Stack Test data shows the following:

Testing Day	Weight Galvanized	Time Galvanizing	Average
June 14, 2016	13,805 pounds	3.77 hours	3,662 pounds/hr
June 15, 2016	13,951 pounds	3.98 hours	3,506 pounds/hr

[726] These averages show significant deficiencies in the representativeness of the 2016 Stack Test and in Ebco's methodology for calculating production rates for later Stack Tests, as described by Mr. E. Eppich. The 2016 Stack Test is based on an average production rate during active Galvanizing of between 3,506 and 3,662 pounds per hour. Ebco's calculated average rate to be used in Stack Testing in 2020 was 4,199 pounds per hour. A review of the production records available while Ebco was operating under the Permit shows production rates during active Galvanizing of between 6,724 and 15,522 pounds per hour.

[727] Based on the average production weights during while Galvanizing during the 2016 Stack Test, compared with the average production weights during active Galvanizing over the five operating dates during the life of the Permit, the rates during the 2016 Stack Test represented 23% to 54% of the rates during those five operating dates.

[728] Mr. E. Eppich's estimates of weights Galvanized illustrate the same problem. He testified that typical weights Galvanized range from 500 to 20,000 pounds. The average is from 4,000 to 5,000 pounds per dip, but the maximum ever done in a dip is 25,000 pounds. This maximum dip weight is nearly fifteen times the weight dipped for the 2016 Stack Test and over seven times the weight dipped both for the 2018 Stack Test, when using the hourly average methodology Mr. E. Eppich described in the oral hearing.

[729] Ebco says production during the 2020 Stack Test was five times the weight it should have been. This means a production rate of about 21,000 pounds per hour. This is above the typical range Mr. E. Eppich described, but less than the maximum dipped at the Facility.

[730] The Permit is always active. As it is written, it does not prescribe limits averaged over some period of time or allow for emissions that are typically below a certain threshold. It provides for absolute limits in the concentration of contaminants that can be released into the environment at any point in time. As a result, the panel considers it appropriate that the terms of the Permit should be informed by, and verified through, Stack Testing of the highest production levels at which the Facility operates or is expected to operate.

[731] Accordingly, it is not clear whether the results of the August 2020 Stack Test were, in fact, inappropriately high, as Ebco says they were. As such, the panel is unwilling to consider the August 2020 Stack Test results an aberration. To the degree that the November 2020 Stack Test attempts to correct a problem the panel does not consider to exist, the panel is not satisfied that the November 2020 Stack Test results are reliable. Assuming the November 2020 Stack Test was based on "normal production" levels, which

Ebco estimated to be roughly 4,200 pounds per hour, the panel finds that the November 2020 Stack Test, like the 2016 Stack Test, to not be based on an accurate representation of activity at the Facility.

[732] Given that Mr. E. Eppich described a common methodology that has been applied during each Stack Testing event, the panel is not persuaded that any of the Stack Test results are truly appropriate. As explained above, the August 2020 Stack Test may in fact be the best available evidence of emissions from ES01.

[733] The general production records available to the Board outside of the 90-day period leading up to the 2020 Stack Test provide the weights of steel dipped on a per-shift basis, not on a per-dip basis. Even using that data, the variability in weights dipped range from 4,134 pounds to 65,239 pounds per shift. The 2016 Stack Test is based on production weights that match only 3 of the 106 shifts in the 90-day period leading up to the 2020 Stack Test.

[734] Since operations were not ongoing at the Facility at the time, and the point of the production done during the 2016 Stack Test was to establish the nature and quantity of emissions at a specified production level in the Facility, the panel is satisfied that the amount of Pickling done during that Stack Test was proportional to the steel Galvanized at that time and to the quantity of emissions from ES01.

[735] This analysis is corroborated by the production documents, which describe a largest weight of steel pickled during Stack Testing of ES02 (4,350 pounds) during the first sampling event, which lasted 73 minutes, was 3,575 pounds per hour. This hourly rate had the largest weight of pickled material and so would be expected, all else being equal, to have produced the largest quantity of emissions from ES02. The panel notes this is similar to the hourly amount of steel Galvanized during Stack Testing from that date: 3,662 pounds per hour. The difference in weight may reflect that production documents from that date describe pre-Galvanizing weight for Pickling, and post-Galvanizing weight for Galvanizing.

[736] It follows for the reasons above that the panel concludes the Pickling done during the 2016 Stack Test was not representative of a significant portion of the full range of the Facility's production levels.

[737] The panel appreciates that there is considerable variability in the Stack Testing results on any given day, and they often indicate considerable margins of safety where concentrations of potential air contaminants are concerned. There have been, however, instances where Metro's ambient air quality standards have been exceeded. Given that the panel considers the Permit to have been based on Stack Testing that underrepresents the Facility's typical production levels, and that testing and verification through Stack Testing has also been based on underestimates of production levels, the panel considers further, better evidence to be necessary to address the questions of what emissions are being produced by the Facility.

[738] The necessity for further, better evidence to address emissions includes the emissions from ES02. The nature of further investigation of emissions from ES02 are described in further detail later in these reasons.

[739] The panel also was left to wonder about the method used by Lanfranco to measure emissions from ES02. In particular, the structure built around and above the roof vent tested at ES02 during 2016 Stack Testing likely affected the airflow of emissions from that vent. The methodology may have been suitable. Unfortunately, testimony from an expert on this point was unavailable and so the panel cannot effectively grapple with this question in an informed way.

[740] Furthermore, from a review of pictures submitted into evidence, it seems that rain deflectors were in place on ES02 during 2016 Stack Testing. It is not clear from Lanfranco's associated report how the rain deflector was accounted for within these test results, or if it was accounted for at all. All parties agreed, in the hearing, that these deflectors altered the dispersion of emissions from ES02 into the environment, which is why Ebco removed them. It is unclear if these rain deflectors also would have affected the reliability of Stack Testing of ES02. Expert evidence on this point was not available to the panel so, again, the panel could not assess this issue with the benefit of any expert evidence.

[741] For all these reasons, the panel considers it appropriate to refer the matter of the 2016 Stack Test back to the District Director. The Board's directions with respect to this issue are provided later in these reasons.

[742] Having reached this conclusion, the panel does not consider it necessary to address further allegations, such as if plastic sheeting in the Facility at the time of the 2016 Stack Test altered the results of that test, either intentionally or unintentionally on the part of Ebco. Further Stack Testing will be conducted within the Facility.

Comparison with Silver City

[743] The panel does not find the Silver City Facility to be a suitable comparison for the Facility. There was a lack of persuasive evidence about the degree in similarity between the two operations, including their galvanizing processes. The Silvery City Facility also reportedly uses hydrogen chloride in Pickling, while the Facility uses sulphuric acid.

[744] Because the appellants wish to compare the two facilities, they bear the burden of establishing that these are suitable comparators. They have not done so. In fact, the evidence provided in the hearing suggests that the emissions associated with Pickling in particular cannot be reliably correlated, as they are generated from the use of different Pickling acids. The panel finds that there is not enough persuasive evidence to support the conclusion that the emissions associated with galvanizing at the two facilities can be correlated. Accordingly, the panel does not consider the Silver City Facility to be a suitable standard or comparator against which to assess the terms of the Permit.

[745] The panel finds that references to complaints associated with the Silver City Facility before Silver City was prosecuted by Metro are not persuasive. The panel agrees that public complaints may be considered as evidence in determining whether an air emission permit is sufficiently protective of human health and the environment, a regulated facility is complying with the terms and requirements of its permit, and prosecution is appropriate. Each case is considered in its own circumstances, however. The existence of similar complaints in two cases is not enough to conclude that they are both related to air contaminants or to any specific type or concentration of air contaminants. Furthermore, what Mr. Robb may have considered to be a sufficient evidentiary basis for prosecution of Silver City does not assist the Board in weighing the evidence in these appeals. The issues are different, the factual circumstances are different, and the roles of Mr. Robb and the Board are different in these different processes.

Environmental Monitoring Results

[746] As described by Mr. Choi, Dr. Preston, and Mr. Robb, the environmental sampling program required under the Permit allows the tracking of any changes in soil, water, and plant tissue chemistry at specific points over time. To establish any causes for these changes, evidence in the form of expert testimony is required. Similarly, to extrapolate larger trends—in space, in time, or both—requires the presence of expert evidence. These questions do not depend on phenomena which can be observed or measured and so require opinion evidence which builds upon phenomena that can be observed or measured. They are beyond the education, experience, and training of any average witness, meaning that expertise is required to extrapolate or determine causation with respect to any changes in chemistry detected by the environmental sampling program.

[747] The panel considers that the reliability of such analyses increases when there is more data available, all else being equal. Trends over time can be extrapolated more reliably and convincingly where they are based on a longer period of measurement or on more measurements within the same timeframe, where there is more reliable data available to support any interpretations made.

[748] As a result, turning to Mr. Choi's analysis of the environmental sampling results, his latest analysis is most worthy of consideration. Given that it is consistent with his earlier analyses, the panel will focus on that latest analysis.

[749] Mr. Choi has indicated, after reviewing several years of environmental sampling, that there are no clear trends showing increasing concentrations of nickel and zinc in the soil, water, or plant tissue sampled by Envirochem. The data Mr. Choi provided is consistent with that interpretation.

[750] Mr. Choi also explained the period of time when increased nickel and zinc was present in the soil sampling at SL1A as being driven by runoff from the Site. This explanation accounts for the location of SL1A relative to the Facility and coincides with the period of time during which the Bioswale was compromised after being cleared of

vegetation and was eroding, such that water was bypassing the relevant lawn drains and flowing downslope toward SL1A. Mr. Choi's assessment is harmonious with the relevant circumstances and with the concentrations of nickel and zinc measured as SL1A, including the measurements afterward which showed no identifiable increasing trend in these concentrations after the remediation of the Bioswale. For these reasons, the panel finds Mr. Choi's assessment persuasive with respect to the trends of nickel and zinc concentrations in soil at the locations monitored as part of the environmental sampling program.

[751] Furthermore, the panel is persuaded by Mr. Choi's opinion that, to the extent there have been measured increases of nickel and zinc in soils measured in the environmental monitoring program, all results were within the average provincial background levels for those metals. The panel finds this further supports a conclusion that there have been no significant environmental impacts to date at SL1A, SL2, SL5, or the Background Location.

[752] For similar reasons as above, the panel also accepts Mr. Choi's opinion there is no sufficient basis to conclude that there has been any identifiable trend with respect to nickel and zinc concentrations measured in groundwater and plant tissue sampling undertaken as part of the environmental monitoring program. Furthermore, based on the regulatory criteria from the *Contaminated Sites Regulation* and references to nickel and zinc content in relevant plant tissue, the panel accepts Mr. Choi's opinion that there is insufficient information to conclude that there has been any trend of increasing nickel and zinc at the locations and of the substances sampled.

[753] The stormwater data indicates some increases in nickel and zinc samples at particular locations. The panel accepts the evidence of Mr. Choi, that the distribution of elevated sampling results is not in keeping with aerial deposition but is more present in higher concentrations where galvanized materials are stored on the Site. The panel accepts Mr. Choi's opinion on these points and relies on his expert opinion that the most likely cause of the nickel and zinc readings in the stormwater system, based on the available information, is runoff.

[754] While Mr. Choi recommended further investigation to assess the possibility that aerial emissions from the Facility have contributed to the elevated nickel and zinc concentrations in the stormwater system, the evidence presented in these hearings does not support such a conclusion. A possibility is not enough: the appellants have asserted that air contaminants are contributing to these stormwater readings and they bear the burden of proving this is the case. Relying on Mr. Choi's opinion, the panel concludes that the appellants have not met that burden.

[755] As such, any environmental impacts associated with elevated nickel and zinc concentrations are most likely attributable to runoff, not air contaminants. This brings any investigation of, mitigation of, or discussion of the impacts of the water in the stormwater system outside of the jurisdiction of Metro and, for the purposes of these appeals, the Board.

[756] The panel notes, however, that Ebco has created and implemented a zinc management strategy to reduce the runoff of nickel and zinc into the stormwater system. The most recent sampling event available to the panel, from 2023, shows mixed results, with reductions in nickel and zinc measurements in several sampling locations. Mr. Choi has recommended further work be done to address these issues and the panel is encouraged that Ebco and Metro continue to consider this issue. It is not, however, within the jurisdiction of the Board to consider in these appeals, for the reasons provided above.

[757] In relying on Mr. Choi's evidence, the panel is aware of some of the shortfalls in the April 2019 SPW Report, as described by Dr. Bolton. While multiple samples were not obtained from each sampling location in the 2019 sampling event, Mr. Choi subsequently altered the sampling protocol and addressed that shortcoming. The averaging of results and the reporting of errors were also improved after the April 2019 SPW Report. Accordingly, the concerns Dr. Bolton raised went to the weight the panel gave to Mr. Choi's evidence. Overall, particularly given the number of higher-quality reports made after the April 2019 SPW Report, the panel found Mr. Choi's analysis to be persuasive.

[758] The panel also considered the evidence provided by Mr. Armstrong. As noted by Ebco, Mr. Armstrong's opinion discussed possible impacts to the environment, including salmonid habitat, resulting from zinc contamination. Mr. Armstrong did not review technical information specific to the Facility, nor any surface water sampling other than samples taken from the ponds on IronGait Farm, which does not provide a sufficient foundation for any opinion about the probability of environmental impacts associated with the Facility's emissions. As such, Mr. Armstrong's evidence provides general information but does not assist the panel in determining whether the Facility's air emissions have had, or are expected to have, any impact on the environment.

[759] The panel also considered the evidence of Mr. Oehr, recognizing it provides opinions at odds with those of Mr. Choi. The panel's analysis of Mr. Oehr's opinion follows.

The Opinion Evidence of Mr. Oehr

[760] The appellants rely on the opinions of Mr. Oehr in arguing that the Facility's emissions result in harm to the environment, particularly with respect to the accumulation of nickel and zinc in Envirochem's sampling locations (most particularly SL1A and SL2). The appellants also rely on Mr. Oehr's evidence to argue that the 2017 Hemmera Report is not reliable and that cadmium and lead constitute air contaminants when emitted from ES01.

[761] The panel does not find Mr. Oehr's opinions to be reliable for four reasons.

[762] First, Mr. Oehr used a statistical modelling program to determine rates of accumulation of nickel and zinc but did not show a sufficient understanding of statistics, or sufficient care with the inputs he made into the program, to offer reliable opinions. Mr. Oehr had only one undergraduate course in statistics and no formal, accredited training in statistics otherwise or in the use of the software he used to formulate his opinion. He had only a passing understanding of fundamental statistical concepts like standard deviation,

being unable to explain how it relates to the distribution of a set of numbers. Furthermore, Mr. Oehr's work was rife with errors, including omitted data points and misplotted data points, which—when properly entered—had significant effects on his conclusions. He also, for example, used the wrong numbers (inclusive of ambient values) for air contaminant measurements from the 2020 Stack Test in formulating his opinion.

[763] Second, Mr. Oehr made large, unfounded assumptions in his analyses. Foundationally, he assumed that increases in nickel and zinc concentrations at SL1A and SL2 were attributable to the Facility based on their increases being proportionately similar, one site to the other. He did not provide a statistical analysis of this and, on its face, the increases do not exhibit a high degree of proportionality. He failed to provide sufficient rationale to allow the panel to accept this opinion.

[764] Furthermore, he extrapolated additional soil concentrations based on the concentration of potential air contaminants in the air as a result of the Facility's emissions. There was an underlying assumption in Mr. Oehr's analysis that the ratio between a maximum concentration in the air and a maximum concentration in the soil can be directly correlated. During his testimony, the following exchange occurred:

> [Mr. Oehr]: … assuming that Hemmera has predicted the ratios properly between the ambient air and the soil, then you can – you can – make the assumption that the – if you apply the corrected soil data to the Hemmera data, you're going to get the same effect on ambient air. It'll be in the same proportion because the air that's in – the air is being affected ahead of the soil….
>
> [Panel]: But that's assuming a linear fit between the air concentration and the increase in the soil concentration.
>
> [Mr. Oehr]: You're correct.
>
> [Panel]: Okay.
>
> [Mr. Oehr]: And you don't know – and you don't know if that's true. We don't know. We don't know what happens to the Hemmera model if the – if the – because I don't have access to the model. I have to treat it like a black box, okay? So it's possible. It's possible.

[765] When questioned on that assumption, Mr. Oehr immediately conceded that he did not know if it was true. The unreliability of this assumption is problematic for Mr. Oehr's analysis of the concentration of possible air contaminants, but the fact that he was willing to make an assumption that he did not know was true is a concern for the reliability of his opinions generally.

[766] Third, Mr. Oehr's opinion is not sufficiently impartial to be reliable. He stated that variations in the levels of metals measured in the Background Location likely came from the Facility without providing any deeper analysis than again simply declaring there to be

a similarity in the increase in concentrations. Mr. Oehr explained that he was unaware of any other sources of nickel or zinc in the area, which is not enough of a reason to reliably infer they came from the Facility, but then conceded in cross-examination that there was at least one other source of zinc in the area that he was aware of. He also attributed pH levels in soil samples to emissions from the Facility before conceding that there could be other, naturally occurring, acids in the soil that explain the pH levels that Envirochem measured.

[767] More troublingly, Mr. Oehr stated that, after finding the data allowed for an interpretation of a "flag," he stated he did not look at more data that might have either supported, or been cause for revision of, his conclusions, saving he "got what [he] was looking for." This suggests that Mr. Oehr was analysing the data to support a pre-conceived notion: that the Facility's emissions were either harmful to the environment or human health or that they had the capacity to be. This is not an appropriate stance for an expert witness to take.

[768] Fourth, Mr. Oehr's theory was inconsistent with later environmental testing by Envirochem. The 2022 SPW Report resulted in a revision of Mr. Oehr's calculated rate of accumulation of nickel and zinc, upon which most of his opinion was based, downward by 50%. After including this data and correcting for data not entered or misplotted by Mr. Oehr, he conceded it was unclear, at least at SL2, whether there was any increase in zinc concentrations based on the measurements taken. This further undermines Mr. Oehr's conclusion that the metals concentrations at SL1A and SL2 are increasing proportionately, which is the foundation for his conclusion that both relate to a common cause: emissions from the Facility.

[769] For all of the above reasons, the panel gives Mr. Oehr's opinion very little weight. It is not sufficiently reliable to be given significant weight.

Symptoms Reported by Witnesses

[770] The appellants presented evidence from a number of witnesses about symptoms they attribute to emissions from the Facility. The witnesses describe unpleasant tastes and smells; burning sensations affecting the sinuses, throats, and eyes; nausea; coughing and hoarseness of the voice; and congestion.

[771] While the appellants do not specifically say that these symptoms relate only to ES02, that is the thrust of their argument. They describe fugitive emissions from ES02 as their principal concern. They assert that hydrogen chloride contained in mists, fogs, or vapours are the most likely culprit for these reported symptoms.

[772] Questions of causation do not necessarily require expert evidence. In some circumstances, for example, emissions from a facility might be visually tracked to a location where it impacts a person who could describe the impacts associated with being impacted by those emissions. Otherwise, however, expert evidence may be required to establish causation. For example, where emissions cannot be tracked by direct

observation, relating the symptoms described by a person at some distance from a facility to emissions from that facility are likely to require expert evidence.

[773] This is the case here, particularly with respect to emissions from ES01. The panel finds that there is insufficient evidence to conclude that emissions from ES01 contributed to the symptoms described by the public. The complaints do not allow the panel to conclude that visual or otherwise observable emissions coming from ES01 or coming from other holes in the Facility's building envelope travelled to a point of impact, where a complainant experiences symptoms. Absent reliable accounts that connect emissions from the Facility to the point of impact, further evidence is required to correlate the two.

[774] The panel recognizes that Mr. Mueggenberg stated that the symptoms described by various members of the public were not in keeping with what the Permit authorizes to come from ES02, but rather with Smoke; however, this is an association that he made based on reported symptoms. The panel notes that Mr. Mueggenberg did not describe seeing or otherwise detecting Smoke coming from ES01. The panel understands his evidence to be that these are fugitive emissions, in the form of Smoke coming from ES02 or from other openings in the Facility. This is specifically what he described witnessing when observing operations in the Facility using binoculars at the Site's fenceline.

[775] There were several complaints that assert there were visual emissions from ES02 as well, generally spreading or dispersing in the environment but maintaining such cohesion and consistency that they can be tracked from the Facility to a point of impact, typically on IronGait Farm or the Thielemanns' farm. Mr. Mueggenberg has, in particular, described such a phenomenon when he describes emissions travelling along the ground in the direction of the Thielemanns' farm or IronGait Farm.

[776] The panel has considered these reports and dozens of pictures taken by various witnesses. We find there is insufficient evidence that emissions from ES02 or from the Facility generally maintain such cohesion and intensity over time and distance that they can be tracked as a moving mass. Rather, we find that the behaviour of emissions is expected to be as shown in the pictures: that the concentration decreases as the emissions disperse into the environment.

[777] In some circumstances, emissions may mix with ambient mists, vapours, fogs, or similar phenomena in the area. The panel recognizes that it is possible some emissions reach complainants through this process, but not at a level of consistency or concentration such that lay evidence is sufficient to correlate emissions from the Facility with the effects attributed to them by various witnesses.

[778] This finding is even more applicable where witnesses attribute their symptoms to the Facility's emissions merely because they are in the general area of or, from their perspective, downwind of the Facility. This is the case with Ms. Kroecher's account of symptoms experienced while walking in forested land near the Facility and with Ms. Orringe's testimony about silver tarnishing downwind of the Facility. This is not to say that it is impossible that those experiences are associated with emissions from the Facility;

merely that correlating those symptoms with emissions from the Facility cannot be done on the basis of direct observation alone and therefore requires expert evidence.

[779] No persuasive expert evidence to that effect has been provided. Various witnesses have described seeing fogs, mists, vapours, or similar coming from the direction of the Facility, or emissions dispersing into the environment upwind of complainants, but the described symptoms cannot be reliably attributed to the Facility on that basis. The Thielemanns, Mr. Mueggenberg, and Ms. Orringe have all reported that their symptoms can come on when there are the mists, fogs, vapours, or cloud-like observations or when there are not. These symptoms have been reported both when the Facility is actively operating and when it is not, including when there is no Galvanizing, Pickling, or Stripping underway. The number of reports is so large that it would be surprising if there were not instances where Stripping, Pickling, or Galvanizing was underway when complaints were filed. For the most part, however, similar complaints to those that correlated in time to such activities were filed much more often when there were no emissions-generating activities underway at the Facility, as described by Mr. E. Eppich, whose evidence on this point was unchallenged at the oral hearing. Thus, expert evidence is necessary to relate the symptoms with the Facility's emissions. As stated above, no persuasive expert evidence to that effect has been provided to the panel.

[780] Even if some witnesses (Mr. Mueggenberg and Mr. Thielemann for example) have experience with sulphuric acid from automotive of farming work, such symptoms and some degree of proximity, hundreds of meters from the Facility, is not enough to establish, to the requisite standard of proof, that those experiences can be attributed to emissions from the Facility. Where the witnesses have experienced symptoms consistent with exposure to sulphuric acid or substances contained in the Smoke, for example, that is not enough reason to conclude that these symptoms are attributable to the Facility without further evidence to support that conclusion. This is the case even where these symptoms first started occurring after the Facility began operating—more than this circumstantial association of time, place, and some consistency in symptoms with what might be expected from emissions from the Facility is required. Other phenomena, including animals or trees dying before they are expected to or animals not being in the area in as great an abundance as previously similarly cannot reliably be associated with the Facility's emissions, absent expert evidence to draw a persuasive connection.

[781] As noted above, the panel has concluded that the expert evidence either was not persuasive or did not support a conclusion linking the witnesses' reports with the Facility. For the reasons provided above, the appellants have not satisfied their burden of proof insofar as they attributed the discomfort or injury of people or animals to the Facility's emissions.

[782] To the extent that the appellants make arguments that rely on these reported symptoms, such as to assert that emissions capture and control from the Kettle are inadequate or that the FEMP is inadequate because fugitive emissions bypass emissions

control and cause symptoms in members of the public, the panel finds these arguments are not established.

The Foal Miscarriages

[783] With respect to the miscarriages of the foals on IronGait Farm, the appellants have not provided sufficient evidence to establish a causative link to the Facility's emissions. They relied on circumstantial evidence, such as the proximity of IronGait Farm to the Facility and some observations about wind direction, to argue for such a link. They also relied on two necroscopy reports submitted to the Board. The first, written by a veterinarian, Dr. Farshad Maloufi, on April 2, 2019, states, "[the] precise cause of this condition, association with exposure to industrial pollutants and impact on vascular perfusion are unknown." Nickel and zinc were both noted to be within acceptable or normal levels in the analysis of samples taken during the necroscopy.

[784] The second, written by Dr. Maloufi on March 3, 2020, diagnosed placentitis and noted bacterial infection and inflammation is a common cause of late miscarriage and premature birth in horses. Both were observed in the placenta cultures taken in this case. Samples were also taken to test for metal toxicity, which was ruled out.

[785] The appellants have alleged that the Facility's emissions caused the foal miscarriages. They bear the burden of proving so on a balance of probabilities. They have not done so. Their circumstantial evidence does not persuasively establish that the emissions had any effect on the horses at IronGait Farm. Furthermore, even assuming emissions to have originated from the Facility and flowed to IronGait Farm, there is insufficient evidence to conclude that such emission caused the miscarriages. As a result, the foal miscarriages will not be discussed further in this decision.

Air Dispersion Modelling and Related Studies

2017 Hemmera Report and 2020 Hemmera Report

[786] As described by Mr. McEwen and Dr. Preston, air dispersion modelling allows projections to be made over a large area or over time, given approximations of air contaminants released into a simulated climate model. This is distinct from environmental monitoring, serving different purposes.

[787] The appellants repeatedly argued that measurements should be given more weight than air dispersion modelling results. The panel agrees insofar as it pertains to the assessment of potential contaminants at the location and time of sampling. The panel also agrees that environmental sampling may be a better basis of inferring rates of accumulation of potential contaminants at a particular location, where there are sufficient data points to establish a trend and where the influence of other factors, which add or remove contaminants from the sampling location, are accounted for. This is not a matter of simply measuring concentrations of a contaminant in a place over time. As stated

previously, generalizing sampling results over time, space, or both requires expert evidence. It is not something within the education, training, and experience of laypeople.

[788] Mr. McEwen provided a detailed explanation of air dispersion modelling both generally and with respect to this particular case. Generally, air dispersion modelling relies on a large number of assumptions. The air dispersion modelling process used in this case has been formulated to make these assumptions conservative: air emissions are assumed to be in their most hazardous or impactful state, without any speciation, and they are assumed to remain in that form. Deposition modelling was based on the highest measurement anywhere in the study area and was uniformly applied throughout that area. Contaminants were assumed to accumulate year-over-year in the study area, a conservative estimate. Furthermore, mixing of contaminant into the soil was assumed to take place only to a depth of 10 centimeters when soil impacts for land use was considered, again representing a conservative estimate insofar as risks to people and animals on the surface, and to agricultural uses of soil. Finally, when the concentration of air contaminants was used in any calculation within the modelling exercise, the highest level from any point in the modelled year was used, giving the panel further confidence in the conservatism of the modelling exercise. Similarly, the maximum concentration in each grid space for the modelled year was used for all subsequent calculations.

[789] The panel certified Mr. McEwen as an expert in air dispersion modelling and atmospheric modelling. He testified that CALMET produces reliable climate models for a given study area and that the inputs used in this case conformed to standard approaches to using CALMET. He also confirmed there were no transcription errors in these inputs.

[790] Background levels of potential air contaminants are assumed to be present at all times at the 98th percentile from sampling periods used by three Metro monitoring stations. The highest such concentration was used and applied universally, in space and time, throughout the air dispersion model. This is, again, a generally conservative measure, at least for almost the entire year and across almost the entire study area.

[791] In terms of the Impact Assessment, the panel accepts the expert opinion of Mr. McEwen that the thresholds established in regulatory standards are inherently conservative in that they are defined with consideration of impacts to vulnerable populations. This is an added layer of conservatism in the various opinions that rely on the Air Dispersion Model Report.

[792] While the appellants argued that air dispersion modelling in this case did not adequately account for building downwash, Mr. McEwen confirmed that this was done using the BPIP. As noted by the District Director, a section of the 2017 Hemmera Report specifically addresses downwash and Mr. McEwen explained that it would be limited to a few hundred meters around the Facility, with directions depending on the wind direction at the time. Given this testimony, the panel accepts that the air dispersion modelling in this case is configured, and was executed, to account for building downwash.

[793] Mr. McEwen noted some sources of additional error in the air dispersion modelling performed in this case. The model would not account for air contaminants adhering to wet surfaces. Additionally, the model assumes that the emissions are neutrally buoyant when compared to air of the same temperature, while it is uncertain if the emissions, particularly those from ES02, exhibit that property. The panel also notes that fugitive emissions, if present, have not been measured, estimated, or otherwise accounted for and would not be represented in the model.

[794] If the panel had any concerns about the impartiality of Hemmera in creating or reviewing either the 2017 Hemmera Report or the 2020 Hemmera Report, the robust and conservative methodology of this study allayed those concerns. The panel also notes, as Dr. Preston stated, Hemmera has an interest in maintaining a reputation for impartiality and those responsible for the reports submitted in this case have professional obligations to be impartial in their work.

[795] Considering all of the above, the panel has a high degree of confidence in the air dispersion modelling exercise set up and executed in this case generally, subject to two concerns discussed below. While the appellants criticized the 2017 Hemmera Report for not considering emissions from ES01C, that emissions source was not even anticipated at the time and the subsequent 2020 Hemmera Report addressed the addition of ES01C.

[796] Furthermore, the appellants argue that the 2017 Hemmera Report was based on general climate data from the Lower Mainland and does not account for the unique microclimates around the Site, including particular wind patterns and water content in the air, which the appellants say affects the dispersion of air contaminants from the Site.

[797] The appellants did not provide sufficient evidence to establish these facts. Mr. McEwen was the only expert in atmospheric modelling to give evidence in this case, and he described the modelling provided by CALMET as generally reliable and appropriately formulated in this case. That the appellants observed wind directions that were at odds with wind directions measured at the nearest meteorological stations, or provided other anecdotal discussions of weather patterns in the area, did not provide enough information to call into question the weather modelling provided by CALMET.

[798] The appellants also criticized the 2017 Hemmera Report for not including discussion on environmental impact by a biologist. The panel notes that the 2017 Hemmera Report does not need to address all questions. Biological impacts were described with reference to regulatory criteria from the *Contaminated Sites Regulation* and the most stringent AAQOs by Mr. Tiplady and Mr. Haley. The panel does not consider the 2017 Hemmera Report or the 2020 Hemmera Report to be deficient for not including evidence from a biologist.

[799] The aspect of the air dispersion modelling which the panel finds unreliable in this case is its reliance on the 2016 Stack Test, which the panel has concluded was not representative of the Facility's normal range of operations and so does not represent its normal range of emissions. The "normal operations" values calculated by the 2017

Hemmera Report are therefore unreliable, insofar as they are based on unreliable inputs. Any subsequent analyses based on those predictions are also unreliable, as the non-representative data is carried through even sound models and otherwise sound analyses.

[800] The panel has not been provided with expert evidence that allows the correction of the information from the 2017 Hemmera Report given the non-representative product weights Galvanized during the 2016 Stack Test. As we noted above, for periods of active Galvanizing, the product weights during the 2016 Stack Test were 23 to 54% of the equivalent rates during the five days of active production under the Permit for which production records were available. Thus, production values are underrepresented, by this measure, by roughly two-to-fourfold.

[801] If the Stack Test measurements are a proportional under-representation of emissions associated with Galvanizing, the projections from the 2017 Hemmera Report would exceed applicable AAQOs for a number of parameters. Doubling the project contribution would result in AAQO exceedances for PM2.5 and zinc (one-hour average). Quadrupling the project contribution would also result in exceedances for sulphuric acid. This is not to say that the panel finds this to be so, but there is a sufficient indication of a potentially significant impact to the projections from the 2017 Hemmera Report to render it unreliable as a result of the panel's findings on the 2016 Stack Test results.

[802] To the extent that air dispersion modelling was based on the level of air contaminants authorized to be dispersed by the Permit, it is not directly affected by the panel's findings that the 2016 Stack Test does not give a reliable prediction of the Facility's emissions. Critically, however, absent reliable Stack Test data, the panel cannot properly conclude that the Facility's emissions were at or below the levels authorized in the various appealed iterations of the Permit. As such, the panel cannot reliably use the air dispersion modelling information and information derived from it, as the panel is unsure whether the Facility's actual emissions are above, at, or below Permit levels.

[803] The second aspect of air dispersion modelling that concerns the panel in this case is that such modelling does not accurately account for emissions that are lighter or denser than air. This is of particular concern because the emissions from ES02 are, at least in part, a mist containing sulphuric acid and potentially other substances, which may be of a density that is not suitable for air dispersion modelling, based on Mr. McEwen's testimony. The panel does not know if emissions from ES02 would separate, such that mists might behave discretely from the water vapour also emitted from ES02 or if the mists are present in sufficient concentration in the emissions to affect their behaviour once emitted into the environment.

[804] The panel considers it would be necessary to have reliable information about the nature of the emissions from ES02 to address this concern. Without knowing with greater certainty what substances are in the emissions, whether these substances are in the water vapour or the mists, and what proportion of the emissions from ES02 are mists, the panel

does not consider predictions about the behaviour of the emissions to be adequately grounded in evidence.

[805] It follows that the panel does not find the Impact Assessment reliable, even though the panel considers it to be theoretically sound if used in appropriate circumstances. Absent reliable Stack Test data and evidence to conclude that, given the information from the Stack Test, the emissions from ES02 are appropriate for air dispersion modelling. the panel cannot appropriately situate the Facility's emissions at below, equal to, or above the levels authorized in the Permit. The panel's assessment of the reliability of the 2020 Hemmera Report is similar, given how it relies on the 2017 Hemmera Report.

Mr. Tiplady's Opinion

[806] The same analysis as above applies to Mr. Tiplady's assessment, which factored in additional levels of conservatism: soil mixing to three meters when calculating the migration times of deposited air contaminants through the soil. While the appellants also raised other concerns with Mr. Tiplady's evidence, the panel does not consider them to be significant for the reasons discussed below.

[807] The first concern is that Mr. Tiplady's analysis does not account for fugitive emissions. This is not significant because Mr. Tiplady was not called to provide evidence on air emissions or air dispersion. His analysis is based on the conclusions of the various air dispersion modelling exercises in this case, the reliability of which has been explored above. The impacts of his reliance on the modelling outputs have already been accounted for by the panel.

[808] The second concern is that Mr. Tiplady did not consider the nickel and zinc that could be introduced into the subsurface through stormwater recharge of the Brookswood Aquifer. As noted previously, this does not fall within the jurisdiction of the appealed versions of the Permit and therefore of the Board in the context of these appeals. It is appropriate for Mr. Tiplady's opinion to not address any risk of contamination associated with stormwater recharge for that reason.

[809] The third concern is that Mr. Tiplady's analysis does not account for increased impact to ephemeral streams recharged by groundwater when they begin flowing periodically. For such impacts to occur, however, any contamination of the groundwater must have reached a point that it will impact those streams. Mr. Tiplady's opinion is that this would not occur for decades or longer. He compared the time for impacts to the environment, including waterways, to the duration of the Permit. This analysis would be unaffected by any groundwater contamination, which would not reach ephemeral streams until decades after the Permit ceased to be effective. Any concerns about enduring contamination can be appropriately weighed by the panel, but they do not affect the validity of Mr. Tiplady's opinion given the constraints and context he provided for it.

Mr. Haley's Opinion

[810] Mr. Haley's opinion is, as was Mr. Tiplady's, sound but based on information the panel has found unreliable as measures of emissions from the Facility: the 2017 Hemmera Report and the 2020 Hemmera Report, insofar as they were in turn based on unreliable data from the 2016 Stack Test report.

[811] Mr. Haley compared the air concentrations derived by the air dispersion modelling against applicable ambient air quality objectives, which the panel has already found is a conservative comparison insofar as the impacts of air contaminants are concerned. Mr. Haley used the deposition information provided by the Impacts Assessment to conservatively calculate the time until which concentrations of nickel and zinc in the soil would pose risks to human health and the environment.

[812] As above, the panel is satisfied that Mr. Haley's methodology was sound, but is concerned that the data he relied on was ultimately unreliable. As above, Mr. Haley's reliance on the levels of emissions from Stack Testing that the panel has found are not reliable renders his analysis itself unreliable.

[813] Furthermore, as the panel concluded with respect to Mr. Tiplady's opinion, that Mr. Haley's opinion does not factor in any unknown and unmeasured fugitive emissions does not detract from the conclusions he presents. Mr. Haley relies on the results of the air dispersion modelling, and the panel has already appropriately addressed the reliability of that data and the impacts the quality of that data has on Mr. Haley's analysis.

Impacts on the Appeals

[814] The 2017 Hemmera Report, the 2020 Hemmera Report, Mr. Tiplady's opinion, and Mr. Haley's opinion all suffer from the lack of reliable Stack Testing data in the view of the panel. As the panel has determined that the matter of Stack Testing should be referred back to the District Director with directions, those directions will address the impacts of the unreliable Stack Testing data to these analyses.

Questions of Mixed Fact and Law

What are the Effects of Any Misrepresentations Made by Ebco's Representatives During Public Consultation?

[815] The panel finds that Mr. H. Eppich made public comments: the Facility would not emit "zinc smoke" and the only emission from the Facility would be steam. Several of the appellants provided consistent and emphatic evidence on that point and consistent comments are documented in the ESAC Meeting minutes.

[816] While Mr. E. Eppich stated that he did not think the ESAC Meeting minutes were entirely accurate, and expressed concerns about the way questions were asked of Mr. H. Eppich at that meeting, his evidence did not persuade the panel that Mr. H. Eppich did not make the statements described above. Furthermore, while Mr. E. Eppich offered an

explanation for what he thought Mr. H. Eppich meant, the panel does not find that explanation helpful: what matters is that the panel found that Mr. H. Eppich told the public that the Facility would emit no air contaminants, or at a minimum no zinc-bearing smoke. These statements are obviously untrue.

[817] Furthermore, it may be that some representative of Ebco assured City of Surrey Mayor Hepner that there would be a scrubber system in place. The panel does not have sufficient information to reach such a conclusion, but in any event, this would give rise to the same problem: that the public did not have accurate information about whether the Facility would emit air contaminants, what types, or how they would be treated with emissions control technology.

[818] Whether these misrepresentations were innocent or not, their effect served to deny the public accurate information, as they occurred during the required public notification phase of the permit application process. The effect they had was accordingly on the public's ability to responsively comment on whether the Permit should have been issued, or the terms that should be in place for the Permit.

[819] These misrepresentations were not also made to Metro. Accordingly, the effects of these misrepresentations do not extend to the District Director's decision-making process, in terms of whether to issue the Permit and what terms to place in the Permit. The misrepresentations impacted the procedural fairness of the public notification and commentary phase of the application for the Permit.

[820] The cure for such defects, at least as far as the appellants are concerned, is the hearing associated with these appeals. The appellants have had the opportunity to thoroughly explore all aspects of the Permit and make arguments to the Board, in favour of rescinding and varying the Permit. The appellants have done so. The appellant's participation in these appeals has therefore been curative of the procedural defects present in the decision to issue the Permit.

[821] There is insufficient evidence that any other prejudiced party—either a member of the public, a municipality, or another government body—was affected by these misrepresentations. They had the opportunity to file appeals and did not. Insufficient evidence was provided to the panel that any other party's ability to respond, or the content of their responses, to Metro was negatively affected by the misrepresentations. As a result, there are no further effects resulting from these misrepresentations beyond the present appeals being heard by the Board.

When Was Ebco Noncompliant with the Requirements of the Permit?

[822] Because the panel will consider separately the question of whether the Facility discharges air contaminants into the environment that are not authorized under the Permit, this portion of the decision pertains only to events of noncompliance with terms that have been included in the Permit.

[823] The evidence establishes that Ebco was noncompliant with the terms of the Permit by emitting excessive ammonia during the August 2020 Stack Test, as discussed above. While the appellants argue that Ebco was otherwise noncompliant because of some or all of the complaints filed with Metro against the Facility, the panel has not found those complaints to substantiate any effects resultant from the Facility's emissions. The panel finds insufficient evidence, based on those complaints and the expert evidence provided by the appellants, to conclude that Ebco was noncompliant with the terms of the Permit at any point, other than during the August 2020 Stack Test.

[824] The panel notes that the appellants have alleged these incidents of noncompliance and they bear the burden of proving, on a balance of probabilities, that such incidents occurred. They have not done so, other than with respect to the incident during August 2020 Stack Testing. This single noncompliance does not invalidate the Permit, nor does it suggest to the panel that the Permit should be rescinded or varied.

Does the Facility Discharge Air Contaminants info the Environment Contrary to the Act, Bylaw, and Permit?

Air Contaminants Already Defined

[825] The Permit defines certain emissions from the Facility as air contaminants. All versions of the Permit at issue in these appeals define sulphuric acid emitted from ES02 as an air contaminant.

[826] The 2018 Permit has defined a number of the emissions from ES01 as air contaminants: ammonia, ammonium chloride, chlorine, nickel, zinc, particulate matter, and opacity. The 2019 Permit added hydrogen chloride to this list.

[827] There was some evidence that called into question whether some of these emissions even were air contaminants. The concentrations of sulphuric acid emitted from ES02 were, in particular, the subject of scrutiny from Ebco during the hearing.

[828] For the purposes of these appeals, the substances defined by the Permit as air contaminants are air contaminants. The terms of the Permit define them as such, and the appellants have not raised that issue in the appeal. Ebco, as Third Party in this appeal, is not an appellant. Had Ebco wished to appeal whether certain emissions qualified as air contaminants, it could have done so. It did not.

Additional Substances

[829] The appellants have argued that there are other substances emitted by the Facility which are air contaminants and should not be emitted by the Facility. While not their primary ground of appeal, the appellants argue, as an alternative, that cadmium and lead should be designated as air contaminants emitted by ES01, with authorized limits on concentrations to be included. They similarly argue for the definition, for almost all the same substances from ES01 (those already designated under the Permit, plus cadmium and lead), as air contaminants released from ES02. The sole exception is that the

appellants do not seek to add opacity as a defined air contaminant being released from ES02.

[830] The definition of air contaminant depends on its circumstance because it is defined in both section 1 of the Act and section 3 of the Bylaw through its effects, or its capacity to have effects, on people, property, life forms, visibility, the normal conduct of business, and the environment. These all depend on the concentration of the potential air contaminant in any given circumstances, and potentially on other characteristics as well. For example, the temperature and speed at which an emission is released into the environment may affect its dispersion, its effects on the environment, and whether it is an air contaminant. It is not enough to say that, because a substance is an air contaminant when released from one source, it must be an air contaminant when released from another.

[831] As a result, adding a substance as an air contaminant under the Permit requires not only that the substance be emitted, but in sufficient concentration and with any other sufficient characteristics to meet the statutory definition of an air contaminant under the *Act* and the Bylaw. The substance must:

(a) injure or be capable of injuring the health or safety of a person,

(b) injure or be capable of injuring property or any life form,

(c) interfere or be capable of interfering with visibility,

(d) interfere with or be capable of interfering with the normal conduct of business,

(e) cause or be capable of causing material physical discomfort to a person, or

(f) damage or be capable of damaging the environment.

[832] Of these possible criteria, the appellants argue that the emissions from the Facility cause harm to the environment, injure or are capable of injuring the health or safety of a person, and cause or are capable of causing material physical discomfort to a person.

[833] The appellants bear the onus of proving, on a balance of probabilities, that a substance they would like designated as an air contaminant under the Permit meets the requirements above. This will involve a weighing of the evidence in this case, to determine if the definition above is satisfied in respect of cadmium or lead from ES01, or in respect of ammonia, ammonium chloride, cadmium, chlorine, lead, nickel, particulate matter, or zinc from ES02.

Are Cadmium and Lead Air Contaminants Emitted from ES01?

[834] It is not enough for the appellants to demonstrate that cadmium and lead are being released from the Facility. There is no prohibition against the Facility emitting those metals, so long as they do not rise to the level of air contaminants. As a result, to establish that cadmium and lead are air contaminants emitted from ES01, the appellants must provide sufficient evidence for the panel to conclude that, on a balance of probabilities, cadmium and/or lead emissions from ES01 are causing harm to the environment, injure or

are capable or injuring the health or safety of a person, or cause or are capable of causing material physical discomfort to a person.

[835] Cadmium and lead have been consistently detected in emissions from ES01. The average results (across three samples taken in any given sampling event) of Stack Tests range from 0.000006 to 0.00804 mg/m^3 for cadmium and 0.000046 to 0.00086 mg/m^3 for lead. These concentrations do not, on their own, say anything about whether these substances, as emitted from ES01, constitute air contaminants. Adding further uncertainty, as noted above, the panel does not accept the results of the Stack Tests as appropriately representative of the Facility's emissions.

[836] According to the most conservative ambient air quality objectives used by Metro (Texas one-hour exposures in the case of cadmium, and Alberta one-hour exposures in the case of lead), the ambient air quality objective for cadmium is 0.0054 mg/m^3. For lead, the benchmark is 0.0015 mg/m^3. Metro did not consider either cadmium or lead to constitute air contaminants because their "rule of thumb" is that a stack test must be at least ten times greater than the applicable ambient air quality objective—in this case, Stack Test measurements showing cadmium concentrations of 0.054 mg/m^3 or lead concentrations of 0.015 mg/m^3.

[837] Those who spoke about this "rule of thumb" were not tendered as expert witnesses, however, so the panel cannot rely on this reportedly conservative assessment. Furthermore, the 2017 Hemmera Report did not consider the dispersal of cadmium and lead. The panel must, therefore, consider the other available evidence.

[838] The appellants rely on the opinion of Mr. Oehr to establish the impacts of the Facility's emissions on airborne cadmium and lead levels near to the Facility. The panel does not find Mr. Oehr's opinion persuasive for the reasons provided above.

[839] Dr. Lanphear's evidence was far more persuasive on its face, but is of limited use to the panel. He described there being "no safe level" for lead particulate and advised that prolonged exposure over time results in progressive health effects in fetuses, infants, and children.

[840] The panel accepts his evidence from an academic perspective but notes that his evidence would mean that certain emissions like lead and particulate matter would always be air contaminants, regardless of the concentration in which they are emitted or the characteristics of the emissions. This is inconsistent with the system of regulation for air contaminants established in the *Act* and the Bylaw.

[841] The panel therefore concludes that theoretical or academic evidence of an impact is insufficient by itself to designate an emitted substance as an air contaminant. To be so designated, the substance, in the particular factual circumstances of its emission, must be capable of having a discernable effect on human health or the environment as discussed in the *Act* and the Bylaw. It is not enough that there is no safe exposure to lead, for example, meaning that any exposure level may have an effect. To be an air contaminant,

the emitted substance must, in its particular circumstances, have some effect or the capability to produce an effect set out in the *Act* and the Bylaw and established in evidence.

[842] Mr. Haley's evidence provided some guidance. He was the only expert witness to provide a well-reasoned and persuasive discussion on the possible concentrations of lead in the environment after dispersion from ES01. He stated that the ambient concentrations would be proportional to those for nickel because those two metals behave similarly and were emitted from the same source. Mr. Haley conceded this was an estimate, but it is the best evidence available to the panel.

[843] The panel notes that several Stack Test readings show lead concentrations above nickel concentrations, despite the relatively low lead to nickel ratio in the Alloy. The average readings from each Stack Test are summarized below:

Stack Test	**Sept. 2018 (ES01A)**	**Sept. 2018 (ES01B)**	**Oct. 2020 (ES01C)**	**July 2021 (ES01A)**	**July 2021 (ES01B)**	**Aug. 2022 (ES01C)**
Nickel (mg/m^3)	0.0003	0.0008	0.0018	0.0007	0.0005	0.0003
Lead (mg/m^3)	0.00076	0.00086	0.00804	0.00052	0.00046	0.00305

[844] Lead emissions accordingly represent from roughly 74% to 1,017% of nickel emissions in any given Stack Test. Typically, on four of six measurements, lead concentrations exceed nickel concentrations in Stack Testing. The panel also reiterates that it considers the Stack Testing in this case, and the 2016 Stack Test in particular, to underestimate the emissions from the Facility.

[845] The panel notes that the 2016 Stack Test provided nickel concentration measurements of 0.000267 mg/m^3 at ES01A and 0.0001 mg/m^3 at ES01B. These readings are similar to the lowest results from all subsequent Stack Tests. Typically (four of six times), Stack Testing after 2016 revealed higher concentrations of nickel: up to 490% higher in the case of the October 2020 Stack Test.

[846] Taking the most conservative approach using this data, Mr. Haley's evidence is that a fair estimate of the effect of the Facility's emissions on ambient lead concentrations in the air could be up to roughly 50 times greater than its effects on ambient nickel concentrations projected in the 2017 Hemmera Report. The one-hour projected contribution for nickel was 0.00003 mg/m^3. This suggests, based on the most conservative available evidence, that the concentration of ambient lead could be up to 0.0015 mg/m^3 in the area surrounding the Facility.

[847] This concentration equates to the applicable ambient air quality objective for lead used by Metro in this case. As noted above, this is a rough estimate based on Stack

Testing the panel does not consider reliable. Furthermore, the panel was not provided information describing the existing ambient lead concentration levels and so cannot perform any further analysis. The panel considers, based on a proper, conservative approach, there is sufficient uncertainty as to whether lead from ES01 constitutes an air contaminant.

[848] The panel accordingly considers it appropriate to remit this issue back to Metro for further consideration and, if necessary, investigation, along terms described later in this decision.

Are Air Contaminants Other than Sulphuric Acid Emitted from ES02?

[849] As noted above, the panel does not consider the 2016 Stack Testing to accurately represent the Facility's typical operations. Furthermore, all parties acknowledge that, when Pickling Solution mists, any and all chemicals that are within the Pickling Solution may be present in the mists that are drawn up by fans and subsequently emitted into the environment from ES02.

[850] There was considerable discussion at the oral hearing about the specific compounds that might be produced by Pickling and Stripping. The appellants have said that Mr. Robb testified that the mixing of sulphuric acid emissions and zinc chloride creates additional hydrogen chloride, hydrochloric acid, and white sulphate salts such as ammonium sulphate and zinc sulphate. They provided a reference to the transcripts in support of that position, but the transcript contained no such evidence where referenced. His testimony stated that zinc ammonia chloride may release zinc oxide from the Galvanizing Tank. Otherwise, Mr. Robb was describing what expert evidence he would have brought forward when prosecuting Silver City, based on his understanding of their processes and information gathered from material data safety sheets he reviewed at the time.

[851] In any event, Mr. Robb was not tendered as an expert witness and his assessment of chemical reactions in galvanizing would require such certification to be considered on their merits by the panel. The panel accordingly does not put any weight on the precise chemical reactions described above.

[852] Similarly, where Mr. E. Eppich was asked about specific chemical reactions in detail, the Board does not give his testimony any weight because he was not certified as an expert witness. The panel considers Mr. E. Eppich's experience in galvanizing, including as Chief Operating Officer of Ebco, sufficient to allow the panel to rely on straightforward comments where he described chemicals used or the products of reactions, such as the presence of iron staining on the interior wall, on the ceiling, and in the ES02 vent fans.

[853] Without reliable expert evidence on what compounds are in the Pickling Tanks (including the Stripping Tank), the panel has no clear indication of what substances are in the mists generated from the Pickling Tanks, and in what concentration. The parties seem to have agreed, however, that possible substances could include hydrogen gas, iron

sulphates, zinc sulphate, nickel sulphate, and ammonium chloride, resulting from both Pickling and Stripping. That Ebco monitors not only iron and sulphuric acid in the Pickling Tanks, but also zinc, substantiates the conclusion that zinc tends to accumulate in the Pickling Solution and so may be included in mists generated from the Pickling Tanks.

[854] The panel recognizes that while the appellants assert that Mr. E. Eppich testified that Stripping is not always done at low temperatures, the portion of the transcript they identified in support of that assertion did not contain such a comment. The quoted portion of the transcript is from August 17, 2023, page 10, line 25 to page 11, line 7):

> [Mr. Mueggenberg]: ... solution, and we're creating hydrogen as the primary chemical reaction in the tank. Is that not right?
>
> [Mr. E. Eppich]: Sulfuric acid reacts with metal, zinc or iron, and if it's not rusted, it will create hydrogen. If it's pure, it'll create – or if it is rusted, it will create water. If it's pure it will create hydrogen.

[855] Accordingly, while the panel is satisfied that Stripping may generate substances that may, depending on their concentrations and other characteristics, rise to the level of air contaminants, there is insufficient evidence to establish what substances are generated and at what levels of concentration. The panel is satisfied, however, that Stripping occurred as described by Mr. E. Eppich: in a low-temperature Stripping Tank. His evidence was clear and straightforward on that point and, after considering the appellants' questions to Mr. E. Eppich and their submissions on this point, the panel found Mr. E. Eppich's evidence on this point credible.

[856] Similarly, while the appellants stated that Mr. E. Eppich's testimony indicated that Stripping results in hydrogen chloride emissions, the reference to his evidence does not contain such information. Rather, he addressed a question about hydrogen chloride forming white smoke or clouds and replied:

> I think I explained that I've never seen hydrogen chloride emit a white smoke, but when I looked at the same document that was presented to me, it was talking about compressed hydrogen chloride. When you release the compressed hydrogen chloride into normal atmospheric temperature and pressure, it's going to come out cold. You'll experience the same thing if you release propane from your propane tank. 'Cause I found it curious that hydrochloric acid, which is usually supposed to burn skin, is causing frostbit[e]. So I think it's compressed hydrochloric acid may cause a cloud when it is released. I've never seen hydrochloric acid turn into a white cloud in any of the facilities I've visited, including our [indiscernible] plant.

[857] The portion quoted by the appellants was, "'Cause I found it curious that hydrochloric acid, which is usually supposed to burn skin, is causing frostbit[e]. So, I think it's compressed hydrochloric acid may cause a cloud when it's released." As the larger context to the referenced quotation makes clear, Mr. E. Eppich was not describing anything in the Facility, but rather reconciling information in a material data safety sheet with his experience. The panel accordingly concludes that there is insufficient evidence to conclude that hydrogen chloride is present in mists from the Pickling Tanks, including the Stripping Tank.

[858] While Mr. Robb relied on the fact that occupational exposure levels for various substances in the air within the Facility have been considered safe, the panel considers it important to note what exactly MSABC assessed during its occupational hygiene investigation that underlies this reasoning: metal particulate from the Kettle, ammonium chloride from the Flux, and sulphuric acid from the Pickling Solution. MSABC did not consider any other substances of concern from the Pickling Solution, including any sulphates of iron, nickel, or zinc. There is insufficient information for the panel to assess the concentration of those substances in either liquid or gaseous phases.

[859] The panel notes that Mr. E. Eppich testified that the MSABC's investigations concluded that there was no potential for overexposure to zinc oxide and other metal particulate from the Kettle, ammonium chloride from the Flux, or sulphuric acid from the Pickling Solution. This is not correct. MSABC's August 6, 2020, report states that overexposure to zinc oxide and related fumes in the Kettle area is unlikely, but overexposure to ammonium chloride from the Flux Tank and to sulphuric acid at the Pickling Tank are possible (depending on results of air quality testing).

[860] Subsequent testing was described in the MSABC's August 25, 2020, report. The air quality testing indicated that overexposures to ammonium chloride and sulfuric acid were not expected. WorkSafeBC subsequently documented that the air quality samples indicated concentrations of sulfuric acid and ammonium chloride below the applicable occupational health and safety exposure limits for sulfuric acid (0.2mg/m^3) and ammonium chloride (10 mg/m^3).

[861] Further testing of the Kettle area was described in a February 5, 2021, report by the MSABC. It concludes that workers are not expected to be overexposed to metal particulate in the Kettle area. WorkSafeBC subsequently reviewed the findings and concluded that particulate levels described in the report were less than half the relevant occupational safety exposure limits. As such, the panel notes there was not, at any point, a finding by MSABC that there was "no potential for overexposure," but rather no expected overexposure and that concentrations of sulphuric acid and ammonium chloride were within occupational health and safety standards when tested.

[862] Mr. Robb similarly relied on the occupational health and safety standards of the inside of the Facility. He noted that workers in the Facility are not required to wear personal protective equipment to protect them from mists from the Pickling Tanks,

including the Stripping Tank. The panel is unaware of any investigations that have assessed exposure to substances other than suphuric acid that may be present in the mists generated by the Pickling Tanks. Furthermore, details related to how efficiently the mists generated in the Pre-Production Area are drawn out of the building were not provided. Similarly, the panel did not have details related to the degree to which air was drawn into the working area to replace the air evacuated out of ES02, or how mixing occurred in the working area. It is unclear how similar the ambient room air is to that which is evacuated out of ES02. For these reasons, the panel is unwilling to make the same assumption as Mr. Robb, that the air in the Pre-Treatment Area is suitable for occupational exposure levels and, by extension, for untreated emission into the environment.

[863] While Mr. Robb stated that it was unclear if any of these additional substances could be classified as air contaminants and he did not consider it a sufficient priority to investigate the matter, the panel does not make this same conclusion. It is not only that the panel is not guided by the same resource allocation concerns as Mr. Robb, but also that the panel has already found additional Stack Testing to be necessary because the 2016 Stack Test, and indeed the Stack Tests generally, were not conducted during representative, and therefore appropriate, levels of production within the Facility to ensure the continuous compliance required by all versions of the Permit. The effort and expense to screen for these substances of concern does not seem excessive or unwise given these circumstances, including the scope and extent of screening required for other substances of concern.

[864] The appellants also alleged that Smoke escaped the Kettle and made its way into the general working area in the Facility before being emitted from ES02 (among other exits). The appellants assert that the non-standard dips which occurred up to 2020 resulted in such a loss of containment at the Kettle. Ebco disagreed with these assertions.

[865] The panel finds that the FEMP, including the creation of the Secondary Containment, has significantly reduced the vulnerability of the Kettle to losing containment and releasing Smoke into the work area of the Facility. While engineering studies of the FEMP are unavailable and the panel was not provided any mapping of any path Smoke may take within the Facility, it is the appellants that bear the burden of demonstrating that emissions are escaping the Kettle, such that they are emitted from the Facility, through ES02 or otherwise, as air contaminants. They have not done so. Even if, and this is disputed, such events occurred prior to 2020, that does not mean such events are an ongoing concern. The panel concludes there is insufficient evidence to support a finding that Smoke is being emitted from ES02.

[866] Accordingly, the panel considers additional information to be necessary to decide whether there are additional air contaminants, beyond sulphuric acid, being emitted from ES02. The panel directs the District Director to obtain that information, with particular instructions provided later in this decision. These instructions should address the appellants' additional concerns about the location and number of roof vents at which

Stack Testing occurred. These instructions do not provide for any investigation of Smoke as a source of possible air contaminants from ES02.

Does the Permit allow the Facility to Pollute?

[867] As noted above, pollution in the context of these appeals means "the presence in the environment of substances or contaminants that substantially alter or impair the usefulness of the environment."

[868] As stated above, the panel has not found the appellants' expert witness evidence to establish any likely impacts to the environment as a result of the Facility's emissions. The panel has also found the evidence of the witnesses to be insufficient to relate their observations to the Facility's emissions. Accordingly, the appellants have not established that the Facility has caused any pollution, or that the Permit allows it to do so in practice, despite specifying that the emission of air contaminants that causes pollution is forbidden.

[869] Even where Ebco has conceded that it may be, or is likely to be, the cause of symptoms reported in public complaints to Metro, this does not establish that the usefulness of the environment was substantially altered or impaired. Even in such circumstances, the panel finds that the appellants have failed to provide sufficient evidence to establish that Ebco caused pollution, let alone that this was allowed in some way under the Permit, which specifically provides that Ebco is not authorized to cause pollution through the emission of air contaminants, as authorized under the Permit.

To what extent are Ebco and Metro unresponsive to public complaints about the Facility?

[870] The evidence from Metro establishes that it has the capacity to receive complaints 24 hours a day, seven days a week. After reviewing the records of complaints, the panel is satisfied that these complaints were generally assigned to Metro staff promptly, consistent with Metro's policy and procedures for complaints about facilities with air emissions permits.

[871] Metro has explained that, due to resource constraints, Metro staff only contacts complainants when specifically requested to do so. While providing testimony, the witnesses often could not recall whether they asked for returned calls or whether they received returned calls. The complainants describe a general dissatisfaction with the replies from Metro, and frustration that their complaints did not result in any discernable investigations or changes to the operations of the Facility.

[872] In all cases or nearly all cases, Metro referred the matter to Ebco for comment and conducted an internal assessment. The panel considers first the responses from Ebco.

[873] For each complaint assigned to it, Ebco conducted some investigation. At times, these investigations were hampered by the fact that notification of the complaints was received some time after the relevant time. Generally (in almost all cases), Mr. E. Eppich investigated the complaints. The fact that the investigations were conducted by the Chief

Operating Officer or Chief Executive Officer of Ebco—the two positions in which Mr. E. Eppich worked at all relevant times—merits some emphasis. Ebco could have assigned the investigation of complaints to someone with less authority and influence in the corporation, but it did not. Mr. E. Eppich testified that he discussed every complaint with staff and, given his positions of authority in the corporation, the panel considers this to be an indication of a serious response to complaints referred to by Metro.

[874] This is not to say that the panel accepts Ebco's analysis of the complaints. The panel does not rely on Mr. E. Eppich's analysis of the complaints to any degree. Rather, the panel has independently assessed the complaints and arrived at its own conclusion. The key shortcomings the panel has identified with respect to Ebco's assessment of the complaints are as follows.

[875] First, most simply and least concerningly, the panel found that Ebco has underreported the number of complaints since 2019. Ebco reported that there were two complainants (as determined by location) since 2019, yet a review of Metro's records establishes that there were three complainants at two addresses. This is a mild under-reporting of the number of complainants.

[876] More concerningly, however, is Ebco deciding complaints misidentify or misattribute symptoms or experiences as being related to the Facility based on smell. Mr. E. Eppich indicated that he treated complaints describing sour smell or a sulphuric acid smell as being misattributions, as their processes do not produce sour smells and sulphuric acid is odourless. The panel considers Ebco's analysis to be overly semantic: even if pure sulphuric acid is odourless, witnesses for all parties in the hearing described sulphuric acid as being detectable by a nasal sensation which Mr. E. Eppich described as "pinching." Two key complainants, Mr. Mueggenberg and Mr. Thielemann, both described approximating the experience with words that may not be adequate to explain the experience. This is an understandable concern and a reason to not be overly semantic when considering the report of a sensory experience, particularly if received second-hand. This is particularly so given that it is unclear, what substances are present in emissions from ES02. Even if pure sulphuric acid is odourless, this does not mean that emissions from ES02, which may contain substances in similar concentrations to what is present in the Pickling Tanks, will be.

[877] Furthermore, Ebco states in its 2022 Complaint Summary Report that emissions associated with Pickling and Galvanizing are only possible during upset conditions. The panel considers this to be an unfounded assumption used to dismiss complaints as misattributions or misidentifications. In the circumstances of this case, it is important to also recognize that production levels at the Facility may vary significantly, as may the per-pound intensity of emissions based on what is being dipped. The panel is accordingly unclear what Ebco and Mr. E. Eppich meant by upset conditions, when production at the Facility is so variable.

[878] Furthermore, when considering complaints, one must be open to the possibility that there may be an unknown circumstance leading to the reported emission or impact, even in the absence of upset conditions. To assert that normal operations cannot result in detectable emissions creates a situation where no complaints will be used to identify potential issues needing to be addressed within those normal operations.

[879] For these reasons, the panel does not adopt or accept Ebco's assessment of the complaints referred to it by Metro. This does not mean, however, that every aspect of Ebco's investigation was not sound: the panel has simply highlighted why it does not agree with Ebco's assessments in every case and where the panel considered Ebco to underreport the number of complainants.

[880] The findings above also do not mean that Ebco was unresponsive to the public complaints. The *Act* and Bylaw do not hold Ebco to any particular standard in whether or how it responds to public complaints referred to it from Metro. The Permit requires Ebco to report to Metro annually about complaints it receives and remedial actions it takes in response. Ebco has done so. It has acknowledged where it agrees that it has been a plausible or the likely source for observations that underlie a complaint filed with Metro. The panel concludes that Ebco was not unresponsive to public complaints: it engaged seriously with the complaints, even if the panel does not find its analysis to be persuasive in each case.

[881] The panel also recognizes that the appellants argued that Mr. E. Eppich did not corroborate his statements about when the Facility was not operating. We do not consider corroboration to be necessary, however. Mr. E. Eppich's testimony was frank and, while the panel was concerned about various aspects of his analysis (described elsewhere in this decision), did not seem to be untruthful or uncertain. For clarity, the panel does not find Mr. E. Eppich's analysis persuasive on several points, but accepts his testimony as to when the plant was operating and not operating, as he defined operating.

[882] Before considering the appellants' assertion that Metro was unresponsive to public complaints about the Facility, the panel notes that whether Metro was responsive or not does not determine whether the Permit should be confirmed, varied, or rescinded. In the interests of providing a full reply to the arguments of the appellants, however, the panel will briefly address this assertion.

[883] The panel finds that Metro did not merely rely on the analyses from Ebco, as alleged by the appellants. A review of the complaint records indicates that, at times, Metro's assessment of a complaint diverged from the assessments made by Ebco. At times, Metro reached the same conclusion or relied on the response from Ebco. At other times, however, Metro arrived at a different conclusion in consideration of the information associated with each case.

[884] The panel also finds that the appellants have not established that Metro ignored, failed to refer, or failed to act on any complaints received. Metro, like the Board, concluded most often that the symptoms reported by the complainants could not be

attributed to the Facility's emissions. The panel agrees with some of those assessments. With respect to others, Metro at times arrived at a different conclusion than this panel might have, or assessed the available information differently, but that is not enough to support a conclusion that Metro was unresponsive to public complaints.

[885] Furthermore, whether Metro chose to prioritize putting further resources into investigating those complaints is a matter of Metro's discretion. The Board does not consider it appropriate to question whether Metro adequately assessed Ebco's compliance with the Permit given the presence of public complaints, but the panel notes that Metro expended considerable time and resources in doing so, including through the creation of the FEMP, which was developed at least in part due to the discussion of public complaints in the hearing of these appeals.

[886] To the extent that Mr. Armstrong may have suggested that Metro had the resources to investigate the Facility further but chose not to, the panel finds such an assertion to be of no assistance. Mr. Robb, in particular, was forthright in describing the limited budget under which Metro operates and how he must determine how to achieve the best environmental results with what resources are available. While such policy decisions are indeed choices, they are not motivated by an improper purpose but rather to maximize benefits. Mr. Robb and Dr. Preston both made clear that the public response to the Facility motivated Metro to subject the Facility to more exacting permitting requirements than it would have otherwise had to deal with, and to expend more resources per dollar of permit fees (correlated with environmental risk, in Metro's estimation) than any other facility in recent years. The panel wishes to make clear; it is not the Board's place to criticize how Metro uses its resources but, in any event, we find no basis for faulting Metro's responses to the public in this case.

[887] For the reasons provided above, the panel concludes that Metro was not unresponsive to public complaints about the Facility.

Does the Facility use BACT to mitigate the release of air contaminants?

[888] The panel considers that any discussion of BACT depends on the nature and concentration of air contaminants being released into the environment, as authorized by the Permit. The question of BACT is a permit condition, not a test enshrined in the Act or the Bylaw. As such, given that the nature and concentration of air contaminants authorized under the Permit is an issue to be addressed further, this question should be remitted to the District Director, with directions set out below. The panel considers, however, that some discussion of BACT, starting with the definition of BACT, could assist the District Director in implementing this decision.

[889] The definition of BACT, as applied by Metro, includes not only the concept that the control technology can reduce emissions of a certain type but also that the technology be practical and commercially available. Mr. Kemp also considered what concentration of the

specific air contaminants were authorized for emission, both in Metro and in other jurisdictions, in assessing BACT.

[890] Mr. Kemp's explanation indicates that BACT is not a concept that involves using every available means to reduce the emission of air contaminants. Instead, it considers what emissions control technologies are reasonably required in a variety of jurisdictions to establish minimum standards that have been applied in working to achieve or maintain whatever ambient air quality objectives exist in those jurisdictions.

[891] The appellants have argued that scrubbers should treat air emissions from both ES01 and ES02. They say that these would reduce the discharge of air contaminants from those sources: hydrogen chloride from ES01 and sulphuric acid from ES02, possibly among others. The appellants say this would represent improved emissions capture and so would be better emissions control technology than not having those control technologies in place. They argue, accordingly, that without scrubbers, ES01 and ES02 cannot meet BACT requirements.

[892] This illustrates the fundamental disconnect between the parties on this issue. Are the appellants correct, that BACT refers to an absolute objective of reducing the amount of air contaminants discharged into the environment? Or is Metro correct, that BACT refers to a baseline of reasonable control technology used in Metro and elsewhere to achieve various ambient air quality objectives?

[893] BACT requirements are not enshrined in the *Act* or the Bylaw. It follows that they ought not to be interpreted based on the intention of the *Act* as they may serve additional policy purposes rather than simply enacting the intention of the legislature. Compliance with BACT requirements is therefore a policy that Metro has created to clarify and give consistency to the District Director's exercise of discretion whether or not to issue an air emissions permit. Metro's BACT requirements align with the strategy of incremental improvement in air quality described in the oral hearing by Mr. Robb and Dr. Preston. Each time an air emissions permit is issued, Metro assesses a number of jurisdictions to determine what is commercially available and practically used to mitigate the release of air contaminants into the environment.

[894] The panel considers this to be a reasonable approach, even if the term BACT may be confusing to some and suggests the existence of an absolute criterion to minimize the emission of air contaminants. Rather, it is an exercise in incremental improvement and gauging what is reasonable to expect of permitees operating within Metro.

[895] Because BACT requirements do not have the force of law, this also means that they do not need to be followed in each case. Metro, and the Board by extension, could decide to issue an air emissions permit where BACT requirements are not met, or could decide to require emissions treatment beyond the level of BACT, provided such requirements met the legislated test of what is advisable for the protection of the environment.

[896] In the circumstances of this case, the panel finds that BACT requirements, as defined by Metro, should be applied. The use of this standard promotes consistency in decision-making and helps to ensure that prospective permitees are treated alike. Unless sufficient reason is provided to deviate from Metro's BACT procedure, the panel considers that it should be followed. The appellants did not offer sufficient persuasive argument why the Metro should have had requirements above and beyond BACT in this case, so the default proposition stands.

[897] To be clear, any representations by a representative of Ebco that the Facility would be "state of the art" and release only steam does not tie the hands of Metro in this case. As noted above, if there were any misrepresentations made by Ebco, it resulted in procedural unfairness for those who attended the meeting and were misled about what they should address in making public comments on the proposed 2018 Permit. As was further noted above, any such defects have been cured.

[898] With respect to both technical reviews done in this case (one leading up to the 2018 Permit and the other leading up to the 2020 Permit) described a baghouse as BACT for ES01. As stated above, the panel does not consider the Stack Testing in this case to be reliable and, when more reliable information is gathered, the panel considers that the District Director will once again have to address the question of BACT for ES01. The panel does not rely on Dr. Bolton's evidence on this point, as the panel did not certify him as an expert in emissions control technology.

[899] What BACT means for ES02 is less clear. As the appellants note, Mr. Yuen provided an opinion that a sulphuric acid "flume" is expected from Pickling Tanks, and BACT to treat that was "wet scrubbers and mist suppressants." It is not clear whether each individually constitutes BACT (i.e., that there are two different technologies that individually satisfy BACT requirements) or the presence of both constitutes BACT. Mr. Yuen was not made available to the panel to discuss this ambiguity.

[900] Mr. Kemp's recommendation was clearly that Anti-Vapour alone constitutes BACT for the Pickling Tanks. The BACT standard he was using, however, is unclear. Mr. Kemp's technical review, as documented in his memorandum dated October 31, 2017, references that BACT standard from Texas. The memorandum notes, however, that Massachusetts BACT for acid mist was for a 98% reduction. Mr. Kemp noted that a question for Ebco was, "Does the [Anti-Vapour] meet the 90% TX BACT requirement? Does it meet the 98% MA BACT requirement?"

[901] Mr. Kemp's October 31, 2017, memorandum notes that Ebco replied: "EBCO proposes to use sulphuric acid which does not fume (as hydrochloric acid does) and the 90% proposed reduction in misting from the sulphuric acid bath is comparable." Mr. Kemp was not called as an expert witness so the panel does not rely on his evidence to support that sulphuric acid does not fume. Furthermore, it is not clear to the panel why Mr. Kemp based his opinion on the 90% threshold and not the 98% threshold or whether the differences between those thresholds may be due to differences between their associated

jurisdictions, such as climate, and whether one may be more applicable to Greater Vancouver.

[902] Furthermore, Mr. Kemp testified that he was unaware of the large hole at the south end of the Facility when he made his BACT assessment. He stated this would make him ask questions of Ebco that may affect his recommendation. Even when told about fans blowing air in from the outside at the south end of the Facility, Mr. Kemp persisted that he would have had questions.

[903] In light of these uncertainties, the panel considers it necessary that Metro define the appropriate standard of BACT for ES02. This means determining whether Anti-Vapour alone can satisfy that requirement or if a scrubber was also needed, and if Anti-Vapour alone is sufficient, what is the required level of mist suppression.

[904] The panel also considered whether BACT requirements for either ES01 or ES02 under the 2020 Permit would be different than those under the 2018 Permit. Mr. Robb explained his view that, since ES01 and ES02 satisfies BACT requirements under the 2018 Permit, they did so under the 2020 Permit. He stated that the changes documented in the 2020 Permit (the higher volume of air passed through ES01, the Secondary Containment, and the FEMP) represented improvements in capture technology, while ES01 and ES02 were otherwise consistent. The panel agrees that these changes in the Permit do not require a different BACT assessment than the one done leading up to the 2018 Permit.

[905] The panel also considered the appellants assertion that a wet scrubber would make Stack Testing of ES02 easier than it is for the current configuration of ES02. The panel agrees with the District Director that Mr. McEwen was not certified as an expert in emissions control technology or stack testing.

[906] In reassessing the BACT requirements, the District Director will need to consider the concentration of emissions from the Facility associated with better representative Stack Testing. This will include an assessment of the BACT needs associated with whatever air contaminants are to be authorized under ES01 and ES02, as indicated by the updated Stack Tests.

Are the monitoring (including weather monitoring), testing, reporting, and modelling requirements in the Permit sufficiently protective of the environment?

[907] The appellants have requested a number of terms be introduced or varied in the Permit to provide better monitoring of the weather around, and emissions from, the Facility, as well as of emissions testing, reporting, and modelling. These are discussed in turn.

Weather Monitoring

[908] The appellants ask that Ebco be required to install a weather monitoring station at the Site to better measure the local microclimates in the area. As noted above, the panel

accepted Mr. McEwen's expert opinion on the reliability of CALMET to model weather conditions in the local area.

[909] The panel recognizes that the appellants have described different wind directions than are indicated at points in time compared to the nearest meteorological stations, but the appellants did not provide sufficient information to establish that these weather stations are not accurately recording weather where they are, or that using a combination of the readings of the three results in CALMET produces an unreliable weather model. The panel relies on the expertise of Mr. McEwen in atmospheric modelling and concludes that the appellants have not provided sufficient evidence to establish the need for an additional meteorological station or that Ebco should pay to have it installed and operated.

Mass Balancing

[910] The panel considers that mass balancing is not a practical solution for the Facility. The quantity of air contaminants emitted from the Facility through ES01 and ES02 are often in the range of micrograms. Weighing all materials such as raw steel, zinc, Anti-Vapour, and IronSave to that degree of precision is not practical, if it is even possible. The panel is concerned that simply transporting the baghouse filters for weighing would result in the loss of several micrograms of material, if not more. This source of error alone would compound for every filter cleaning, unless a mass balancing exercise was conducted every time a filter was cleaned. The panel considers that the error in measurements would rapidly exceed the amount of unaccounted material that would be presumed to have been discharged into the environment, or the process would be so cumbersome as to affect the viability of Ebco's operations at the Facility.

[911] The panel does not consider mass balancing to be sufficiently reliable or practical in the circumstances of this case and declines to require its inclusion in the Permit, or even to have the District Director consider its inclusion.

Continuous Monitoring

[912] The appellants reference the variability in the Facility's production levels, and its production schedule, to argue that continuous monitoring is necessary. Dr. Bolton noted, in particular, that a true picture of the Facility's emissions could not be obtained without sufficient data points gathered over a period of time (a month, he suggested). This would involve sampling at random times to gain a better understanding of the emissions from the Facility.

[913] There is little evidence available to the panel on the expense associated with continuous monitoring. Mr. Robb and Dr. Preston both testified that the technology which continuously monitors emissions concentrations is expensive to install and operate and is required of only the largest emitters of air contaminants in Metro. Their evidence suggests that it would be disproportional to require a relatively small-volume emitter like Ebco, with its annual permit fees of roughly $230, to install and use this technology.

[914] The appellants have argued for the inclusion of such a monitoring system, but have not provided any persuasive evidence that it is available at a reasonable cost or that it would be a reasonable solution given ongoing maintenance needs. They have not contested that such technology is used in emitters who emit similar volumes or inventories of contaminants into the air, either within Metro's jurisdiction or otherwise. The appellants have not met their burden of proof with respect to this issue.

[915] Similarly, while they have also argued for continuous opacity monitoring technology, the appellants have not advanced sufficient evidence to allow the panel to grapple with the costs involved with (both capital and operational), or the benefits of, such technology. The appellants seem to suggest that an opacity monitor would provide a safeguard against malfunctioning baghouses, but the leak detectors already mandated by the Permit fulfill that function. The appellants have not led sufficient evidence to establish that the leak detectors are in some way inadequate for this task.

[916] With respect to variability in the Facility's emissions, the panel notes that detailed assessment of emissions at all times is not necessarily advisable or required for the protection of the environment. Provided the Permit is structured conservatively, so that the variability in emissions is captured by the level and character of emissions authorized to be released under the Permit, that it may be adequately protective of the environment. This is the strategy the panel finds most reasonable in this case, and it does not call for continuous emissions monitoring. The method by which the emissions from the Facility are monitored does not need to be set by the panel, so long as that method provides accurate information on the Facility's emissions which can be assessed against the Permit's requirement for continuous compliance.

[917] For these reasons, the panel concludes that the appellants have failed to demonstrate sufficient need for continuous monitoring equipment to be required under the Permit, whether for the monitoring of emission concentrations of air contaminants or for the monitoring of opacity.

Stack Testing Frequency for ES01

[918] The Permit requires Stack Testing of ES01 every year, alternating between testing of ES01A and ES01B together one year and testing of ES01C on the other.

[919] The appellants say the Permit should require the simultaneous Stack Testing of ES01A, ES01B, and ES01C. Dr. Preston was not concerned about this, nor was Mr. Robb, who stated that Metro staff would ensure normal operations, and this would guard against any manipulation of Stack Test results through shifting emissions preferentially away from the baghouse(s) being tested at that time, toward the one(s) that were not.

[920] Dr. Preston added that the size of the Facility and its compliance history supported Stack Testing on a two-year rotation. Mr. Kemp recommended a two-year rotation because of the work involved to set up and run a Stack Test.

[921] The appellants were concerned that Ebco might obtain favourable Stack Test results by diverting more exhaust out through a baghouse that is not being tested during a Stack Test. They say that testing should be done every twelve months, arguing that this is the case under the air emissions permit for the Silver City Facility. The appellants say this would improve data collection and safeguard against malfunctioning emissions control technology, as well as better reflect Ebco's compliance history under the Permit.

[922] The panel notes that the appellants bear the burden of proof to establish that the permit terms are inadequate, if they want those terms changed. In this case, the appellants have not provided sufficient evidence to establish that there is a risk, beyond a speculative possibility, that Ebco would attempt to manipulate, or has attempted to manipulate, Stack Test results. They also fail to establish that Metro staff ensuring "normal operations" are underway during Stack Testing would not prevent Ebco from manipulating the flow of exhaust to skew Stack Testing results. The panel has already found that the Silver City Facility is not a convincing comparison for the Facility. The appellants have also not established a sufficient need for further data collection or a risk of malfunctioning emissions control technology, beyond what the leak detector is designed and present to safeguard against.

[923] On the other hand, witnesses from Metro have explained that the Permit terms, as is, are proportional with other emitters who emit similar volumes of air contaminants under Metro-issued air emissions permits. Some of these permits were noted in the hearing to have been surrounded by high population densities. The panel finds this evidence persuasive as the appellants have not discharged their burden of proof with respect to Permit terms associated with Stack Testing of ES01.

Compliance Monitoring at ES02

[924] The appellants argue that ES02 should be monitored, tested, and reported on by Ebco. The panel has already addressed concerns over the reliability of existing Stack Test data. The panel has also addressed the variability of emissions from the Facility, and how setting terms of the Permit conservatively, and the inclusion of requirements for detailed monitoring, can effectively protect the environment. The panel finds there is not enough information to conclude whether the terms of the Permit were set appropriately, given production levels at the Facility were inconsistent with the non-representative Stack Testing results, without any alternative means of measuring variability in emissions rates, such as continuous monitoring.

[925] The panel has referred the matter of Stack Testing back to the District Director. There are provisions for additional monitoring of ES02 available if the District Director considers them advisable for the protection of the environment, as discussed later in these reasons.

Extent of the Environmental Monitoring Program

[926] The Permit required Ebco to submit SPW Reports every six months from October 2018 to April 2020, and then once every two years starting in April 2021. The appellants argue this timeframe is too short: they say SPW Reports should be required every six months in perpetuity, with "exceedances" reviewed by a qualified professional.

[927] Except for some initial concerns in the first SPW Report, discussed above, the panel found Mr. Choi's reports to be detailed and to address changing issues identified by the data. Mr. Choi analysed the increase in nickel and zinc concentrations at SL1A and provided a theory explaining why this happened that the panel found persuasive. Mr. Choi also has been addressing the presence of elevated nickel and zinc in the stormwater system at the Site, showing an ongoing ability to address environmental concerns as they arise. The panel is unsure what the appellants mean when referencing a suitable qualified professional for "exceedances," but is satisfied that Mr. Choi, or someone with a comparable skillset, is able to handle management of the SPW Reporting program, including making recommendations for further studies, as he has done and as Ebco has agreed to.

[928] Mr. Armstrong provided evidence that a long-term, comprehensive environmental monitoring program was advisable but did not provide details about the frequency or extent of monitoring events that he would recommend. The panel accordingly finds insufficient reason in his recommendation to conclude that the existing environmental monitoring program is inadequate. The appellants have not advanced any other persuasive evidence to support that conclusion.

[929] For these reasons, the appellants have failed to satisfy their burden of proof to establish that the Board should vary the Permit requirements for environmental monitoring.

Subsequent BACT Assessments

[930] The appellants say that the Permit does not require any BACT assessment for the Facility until 2029, with no implementation of updated BACT until 2030. They argue that Ebco should be required to submit a BACT assessment plan by October 2025 and a BACT assessment report in due course afterward.

[931] The first difficulty with the appellants' quick timeline is that this decision was not completed until after the timeline contemplated by the appellants, making this timeline impossible.

[932] The larger difficulty, however, is that Mr. Kemp made clear that BACT guidelines are, generally, not updated often. The panel notes that the BACT requirements under the Permit are only required near the expiry of the Permit, presumably so that BACT considerations can be assessed before a new Permit would need to be created for the Facility to continue operating.

[933] The appellants seek the change of this term of the Permit but have not provided sufficient evidence to demonstrate that BACT requirements tend to, or are likely to, change before 2029 or 2030. The appellants have not provided sufficient evidence to allow the panel to conclude that an earlier date for a BACT assessment plan or BACT assessment report, which follows the methodology outlined in the BACT assessment plan, is appropriate. The panel therefore declines to alter this term of the Permit as requested.

Is the duration of the Permit too long?

[934] The appellants argue that the Permit should expire by February 28, 2026, to safeguard against pollution from the Facility and impacts to human health and the environment, and to ensure sufficient data is gathered before a longer-term release of air contaminants is authorized.

[935] The panel will refer the Permit back to the District Director to obtain better information on Stack Testing and to determine how that affects the modelling done in this case. The panel has no other concerns about the adequacy of the information available before a proper decision can be made on the question of the Permit.

[936] The panel has not found the appellants' arguments that the Facility is causing pollution or affecting human health and the environment to be persuasive. Accordingly, the panel finds that the appellants have failed to establish that it would be more appropriate for the Permit to expire sooner than February 28, 2033, its current expiry date.

DECISION

[937] For the reasons provided above, the panel refers the issuance of the 2018 Permit and 2020 Permit back to the District Director with directions. Those directions are provided below.

[938] The panel denies the appeals of the 2019 Permit.

Directions for the District Director

[939] With respect to the production associated with Stack Testing, the Board directs the District Director to:

- consider whether it is possible to, in accordance with sound scientific or engineering principles, determine a reasonable method to establish conservative coefficients which allow correlation of the quantity of emissions with the Galvanization of different materials of the same weight that are Galvanized by the Facility (for example, a multiplier for plates, solid beams or tubes, hollow tubes, grates, mesh, etc.);

- in advance of the next Stack Test required under the Permit, review Ebco's production records since the date of the last Stack Test up to a specified date that allows for the remainder of this process to be completed with sufficient time to allow Stack Test reporting to be submitted to Metro on time and determine the date of production associated with the maximum level of emissions, as determined by
    - applying any coefficient determined above, and
    - the weight of steel Galvanized on any given shift;
- determine the hour of highest production within that date as far as is possible, based on the amount of material Galvanized and accounting for differences in the shape of the material based on any coefficient(s) derived as described above;
- apply any coefficient calculated, as set out above, to correlate that production weight with the equivalent production weights of different materials, such that the emissions would be as similar as is possible;
- require the calculated weight of material(s) derived by application of those coefficients, if possible, to be Galvanized during each one of hour-long stack test measurements taken with sufficient time to allow measurement of all Smoke being emitted from ES01; and
- consider whether this process of calculating maximum emissions is operationally feasible for Metro and Ebco year-to-year, and, if so, how to account for production that takes place after production records are provided to Metro but before Stack Testing, or otherwise whether a better process can be determined that would effectively allow Stack Testing to be based on the Facility's highest production rates over the preceding year and, insofar as it is possible, take into account the effects different materials which are Galvanized have on the quantity of emissions produced by Galvanizing.

[940] With respect to ES02, the Board directs the District Director to:

- arrange for Stack Testing of ES02 at a time when the Facility is actively and simultaneously:
    - Pickling steel for Galvanizing, at a rate consistent with the highest production rates from the preceding year, as calculated above, and
    - cleaning a filter from a baghouse;
- identify, either by stoichiometric chemical analysis or by testing, the range of possible air contaminants that could be
    - present in the Pickling Tanks, including the Stripping Tank, during Pickling and Stripping;

    - generated when baghouse filters are being cleaned;
- complete Stack Testing, including tests for all the possible air contaminants defined through the process in the preceding bullet point, plus sulphuric acid;
- conduct sampling of either
    - all eight roof vents simultaneously or
    - one or more roof vents considered likely to have the highest concentration of potential air contaminants emitted and then multiply the results to calculate an overall emission level for all active roof vents (those with operating fans at the time), assuming each active roof vent is emitting the same concentrations of potential air contaminants as the one(s) measured;
- determine whether, at the concentrations measured during Stack Testing, any of those possible air contaminants other than sulphuric acid are, in fact, air contaminants as defined by the Act and Bylaw; and
- determine whether, given the concentrations measured during Stack Testing, air dispersion modelling is a reliable predicter of ES02 emissions in the environment, with particular regard to the proportion of mists and other substances that may behave differently from a gaseous emission, including due to any differences between the buoyancy of those emissions relative to air of the same temperature;
- if necessary, conduct a new and reliable prediction or measurement of ES02 emissions in the environment, whether through air dispersion modelling or another method better suited to analyse or predict the behaviour of emissions from ES02; and
- set appropriate terms and limits in the Permit for any air contaminants so identified.

[941] The Board directs the District Director to consider, and if necessary, investigate, whether cadmium and lead are air contaminants released by the Facility, as defined by the Act and Bylaw. The District Director is directed to, at a minimum:

- ascertain ambient cadmium and lead concentrations in the air, using
    - the maximum recorded value from the three nearest Metro air quality monitoring stations, consistent with its methodology for the rest of the Permit, if possible, or
    - another mechanism by which ambient cadmium and lead concentrations can be conservatively and reliably estimated;

- determine whether an additional contribution of lead particulate of 0.0015 mg/m^3 above ambient from ES01 would constitute an air contaminant as defined by the Act and the Bylaw and
    - if not, make no changes to the Permit based on lead emissions from ES01, or
    - if so, provide Ebco an opportunity to provide air dispersion modelling information on lead based on updated Stack Testing which conforms to the requirements above and on the estimated ambient cadmium and lead concentrations determined as set out above; and
- determine whether any measured cadmium discharges from ES01, including during updated Stack Testing conforming to the requirements above, indicate that cadmium may be an air contaminant as defined by the Act and Bylaw when emitted from ES01 into the ambient background conditions estimated as described above and, if so, provide Ebco the opportunity to provide air dispersion modelling information on cadmium based on that information.

[942] With respect to air dispersion modelling and any impacts analysis or assessment of accumulation of deposited air contaminants on or in the soil and resultant impacts to plant life, groundwater, and groundwater-recharged surface water, the Board directs the District Director to:

- compare the results of Stack Tests of ES01 and ES02 as described above against the concentrations of air contaminants authorised by the Permit;
- determine, based on the results of Stack Tests of ES02, whether emissions from ES02 would be reliably modelled using air dispersion modelling, paying particular attention to whether any mists with a different density than gaseous emissions may separate from the emissions plume and behave differently than currently modelled, or may affect the behaviour of the emissions plume overall;
- where any Stack Test results exceed concentrations authorized in the Permit, require Ebco to provide updated air dispersion modelling information on those specific air contaminants using the methodology applied previously with respect to the Permit by Hemmera;
- if air dispersion modelling data indicates higher air concentrations or deposition rates for any of these substances, provide Ebco the opportunity to submit impacts analyses using the methodology applied by Mr. Tiplady, Mr. Haley, or both;
- decide whether BACT means, for the purposes of treating emitted sulphuric acid emissions,
    - Anti-Vapour with a scrubber,

    - Anti-Vapour reaching a 90% misting reduction as described in Texas BACT requirements, or
    - Anti-Vapour reaching a 98% misting reduction as described in Massachusetts BACT requirements;
- determine whether, given the results of the updated air dispersion modelling information and any impacts analyses as described above, additional emissions control measures qualify as BACT, as the term is applied by Metro and as defined with respect to sulphuric acid emissions and any other potential air contaminants that may be released from ES02; and
- determine, based on all of the above, whether the Permit should have been
    - denied,
    - approved subject to existing terms and requirements, or
    - approved subject to different terms and requirements, including any different emissions monitoring and reporting requirements in respect of ES02.

[943] With respect to the communication of the implementation of this decision, the District Director is to provide a copy of either any new version of the Permit that results from this process or a letter indicating that there will be no resultant amendment of the Permit to the last known addresses or email addresses of the remaining appellants and Ebco. Should any appellants or Ebco wish to update their contact information, they bear the responsibility of doing so if they wish to receive any updated version of the Permit or a letter advising there will be no amendment of the Permit resulting from this appeal. The District Director may provide any such documentation to others as she sees fit.

Further Jurisdiction Over the Permit

[944] Ebco says that, should the Board impose conditions for the protection of the environment that are different from those required by Metro, section 15 of the Bylaw provides that the Board retains supervisory jurisdiction over those conditions and must determine any requests to amend those conditions in first instance.

[945] The Board has not imposed conditions for the protection of the environment in this case, but has instead sent the matter back to the District Director with directions. As such, the panel does not need to address section 15 of the Bylaw, preferring instead to leave the issue for another decision.

Conclusion

[946] For the reasons provided above, the appeals of the 2018 and 2020 Permit are returned to the District Director, with instructions as provided above.

[947] The appeals of the 2019 Permit are dismissed.

[948] In reaching this decision, the panel considered all evidence provided by the parties to these appeals and all submissions made, whether or not specifically referenced. The volume of evidence and submissions meant that not all information could be summarized within these reasons, which contain the most crucial and determinative findings and analysis of the panel.

"Darrell LeHouillier"

Darrell LeHouillier, Panel Chair
Environmental Appeal Board

"Maureen Baird"

Maureen Baird, Panel Member
Environmental Appeal Board

"Howard Saunders"

Howard Saunders, Panel Member
Environmental Appeal Board