REPORT TO THE COMMUNITY 2021

FORT AIR PARTNERSHIP

We Monitor the Air You Breathe

MESSAGE FROM THE CHAIR

The past year has been a great success for the Fort Air Partnership (FAP). Even with the ongoing challenges of the COVID-19 pandemic, FAP has continued to be committed to the ongoing delivery of air quality monitoring and reporting in 2021. As a result of the pandemic, the importance of air quality monitoring was emphasized because respiratory health is a factor in determining a person's risk and response to the coronavirus. This year, our great performance is not a surprise to me as I have watched our Board, our Technical Working Group (TWG), and our contractors invest in resilience year after year.

WHAT WERE OUR CHALLENGES IN 2021? HOW DID WE MEET THEM?

Governance and Communication

The pandemic affected us with the challenges of online meetings. We continued to meet our governance and communications objectives in 2021, albeit not in person. Meetings continued using virtual platforms, including our Annual General Meeting and Open House. Because of our history of solid relationships between our board members, we have maintained board cohesiveness and engagement throughout this period.

Operations

Our operations contractors were able to tweak their activities to follow the Government of Alberta pandemic direction. Some changes had to be made in training and visits to the monitoring stations. However, we did not suffer from monitoring downtime, nor did we have any supply-related problems. This resulted from good pre-pandemic planning, technical support, and inventory management by our Technical Working Group (TWG) and operations contractors.

Finance

Finance is always a challenge for an organization. We enacted the three-year budget reduction plan to mitigate financial challenges experienced by our funders due to the pandemic. This was another demonstration of the work done by the TWG and our contractors in investing in resilience.

Alberta Airshed Community

We continued to grow our resilience by working with other Airshed organizations through the Alberta Airsheds Council. We worked on the most effective use of financial resources and human resources; and shared technical expertise among the Airsheds.

What was new last year?

PurpleAir sensors, donated to FAP by Environment and Climate Change Canada (ECCC), were installed this year. FAP will operate the sensors to expand our network into three communities that do not have continuous monitoring stations: Bon Accord, Josephburg, and Waskatenau. This expanded network enables FAP to provide information on fine particulate matter levels to residents in those communities, which is especially important during wildfire season.

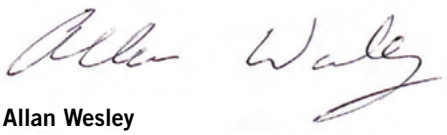
WHAT DO WE EXPECT OUR CHALLENGES TO BE IN 2022? HOW WILL WE MEET THEM?

Throughout all of this, FAP is also planning for the future, supporting Alberta Environment and Parks to develop a Designated Industrial Zone for the Industrial Heartland region. Related to that, we began assessing how our current network may need to be expanded or revised over the next several years to accommodate new industrial development, population growth, and other factors.

Recognizing strong leadership

The Fort Air Partnership has a history of strong leadership supported by industry partners, the Government of Alberta, our contractors, and our public members. In August, we dedicated our Portable Air Monitoring Station to our longest-standing Board member, Keith Purves, who has volunteered as a public member with FAP for the past 25 years.

In summary, my message for 2021 is – Congratulations on your resilience! We have been able to overcome the challenges of 2021. We are well-positioned for future challenges because of the remarkable resilience that we have developed through the excellent work done by the Board, the TWG, and our contractors.



Allan Wesley
Chair, Fort Air Partnership

2021 HIGHLIGHTS

AIR MONITORING NETWORK

Fort Air Partnership (FAP) operated ten continuous ambient air quality monitoring stations, including one portable station, during 2021. Our portable monitoring station operated in two locations throughout the year.

In addition to the continuous monitoring network, FAP operated a 16-site passive monitoring network that provided monthly averages of sulphur dioxide (SO_2) and hydrogen sulphide (H_2S).

Our portable continuous air monitoring station was moved from Sturgeon County to the Town of Lamont in August 2021 and will remain there until August 2022.

The Town of Lamont was selected as a site for the portable station as it is the largest populated area remaining in the FAP Airshed without a current continuous air monitoring station. The station is located at the town's old tennis courts behind the recreation centre at 4848 - 49 Street, near secondary Highway 831.

The station collects and reports data on nine substances in addition to weather information: sulphur dioxide, hydrogen sulphide, nitric oxide, nitrogen dioxide, oxides of nitrogen, ozone, non-methane hydrocarbons, methane and particulate matter. This data enables a daily and forecast Air Quality Health Index (AQHI) calculation for the local area.

Data analysis at the portable station will include comparisons to data generated by FAP's other community stations and the existing Lamont County continuous air monitoring station. The Lamont County station is located seven kilometres from the Town of Lamont.

Lamont Mayor Bill Skinner (right) looks on as FAP Chairman Allan Wesley (left) congratulates Keith Purves.

Portable Station Named after long-standing FAP Board Member Keith Purves

In a ceremony held in Lamont on September 22, 2021, FAP named the portable continuous air monitoring station after Keith Purves, a long-standing Fort Saskatchewan resident and FAP Board public member since FAP's inception.

Keith's involvement predates the formation of FAP as a non-profit society. Several years before FAP's creation, Dow Chemical spearheaded forming a local citizens group in response to community concerns about the impact of local heavy industry emissions on people's health. Keith responded to a newspaper ad seeking volunteers, having recently retired from his job with the criminal justice program at Native Counselling Services of Alberta.

Keith recalls how different FAP was compared to today when he first started on the Board. In the beginning, meetings were held in various members' homes, with conversations primarily focused on how to monitor and report on air quality in ways in which FAP could involve the public. Keith became the Board Chair in 2000 and led a process that formally pursued that aim. Fort Air Partnership subsequently became a society in 2002.

Over time, FAP implemented the necessary policies and systems that resulted in Alberta Environment turning over its Fort Saskatchewan air monitoring station to FAP. Later, FAP also took responsibility for industry air monitoring stations already established in Alberta's Industrial Heartland and the station located in Elk Island National Park.

Keith, currently Vice-chair of the Board of Directors, has been part of the executive team for most of his years with FAP.

Small Sensor Monitoring added to the FAP network

In June 2021, FAP added PurpleAir sensors donated by Environment and Climate Change Canada to its monitoring program in Waskatenau, Bon Accord, and Josephburg. These sensors fill in gaps in fine particulate matter ($PM_{2.5}$) air monitoring in the Airshed. While not as accurate as continuous air monitors, the PurpleAir sensors provide a valuable assessment of the levels of particulate matter in these communities, particularly during extreme events such as the presence of wildfire smoke in the region. Why were PurpleAir sensors installed in the above communities rather than continuous air monitoring stations? They are inexpensive to install and operate and can be a useful indicator of air quality based on particulate matter (a primary component in calculating the Air Quality Health Index).

While data from PurpleAir sensors is of keen interest to the public and other stakeholders, it does not meet Government of Alberta or Government of Canada standards for making regulatory decisions or issuing air quality advisories. As a result, FAP does not use data from these sensors for those purposes.

The $PM_{2.5}$ concentrations reported by PurpleAir sensors can be compared to Air Quality Health Index risk ratings since $PM_{2.5}$ is a primary driver in calculating AQHI in FAP. Data collected by the PurpleAir sensors is available via a direct link to **FAP's website**.

SPECIAL PROJECTS

Sturgeon County Air Quality Assessed

Data collected during a nine-month air monitoring project from July 1, 2020, to March 31, 2021, in rural Sturgeon County indicated that the air quality experienced by the residents in that area of the county is of low risk to health the vast majority of the time. The station was located there to address interest in local air quality expressed by residents in the area.

Since the AQHI is a measurement of air quality pertaining to human health, substances that represent a standard suite of parameters for a community Air Quality Health Index (AQHI) station were monitored during the nine-month timeframe. The 98.5% low risk to health AQHI rating recorded at the station during the project period was slightly higher than three of the four FAP community stations used for comparison in the report. The AQHI at the portable station was in the moderate risk category less than 1.5 percent of the time and less than one-half of one percent in the high-risk category.

In addition to AQHI results, the portable station's air monitoring results showed that:

- Particulate matter ($PM_{2.5}$) levels compared well with those at other rural sites in FAP's Airshed.
- Hydrogen sulphide (H_2S) levels did not differ substantially from other FAP stations where H_2S is monitored.
- Total hydrocarbons (THC) are made up of non-methane hydrocarbons (NMHC), of which this location had the lowest annual average across the FAP network, and methane (CH_4), which varied little from other FAP stations.
- Nitrogen Dioxide (NO_2) levels were generally lower than levels recorded at other stations within FAP's Airshed, especially during the winter months.
- Ozone (O_3) levels did not differ substantially from levels recorded at other stations within FAP.
- Sulphur Dioxide (SO_2) levels also did not differ substantially from levels recorded at other FAP stations.

The complete report is available on **fortair.org**.

Bruderheim Volatile Organic Compound Study

A report was released in October of 2021 that summarized the results of a monitoring study of a type of hydrocarbon known as Volatile Organic Compounds (VOCs) completed in the Bruderheim area in 2018. Results showed that levels measured during the study did not exceed established provincial objectives.

The project was conducted in two separate phases: Phase 1 ran from October 2014 to March 2015, and Phase 2 ran from July 2017 to July 2018. As was the case prior to the study, continuous monitoring of non-methane hydrocarbons, including the VOCs sampled during the project, is also occurring at the Bruderheim station subsequent to the study. For the past five years, the measurements have shown no discernible trend changes, either up or down. The monitoring study was conducted in response to recommendations from a network assessment conducted on the FAP network in 2012 and to address questions raised by residents in and around Bruderheim regarding the impact on air quality of emissions from oil and gas installations in the area.

Almost all 24-hour samples contained pentane, butane, propylene, n-hexane, and methylcyclohexane during the monitoring project term. In previous North American studies, these VOCs have been associated with gas or vapour emissions from pressurized equipment due to leaks and other unintended or irregular releases from the production and storage of petroleum-based products.

In addition to this general observation, a few samples contained complex mixtures of VOCs or, at times, very few VOCs. VOCs measured during the study did not exceed established Alberta Ambient Air Quality Objectives (AAAQOs) or Texas Air Monitoring Comparison Values (AMCVs). This is despite multiple possible source types and the Bruderheim station (located in town) being in an area with various sources known to emit hydrocarbons into the atmosphere.

The complete report is available on **fortair.org**.

PERFORMANCE

Standards Met

The average monthly uptime in 2021 of all continuous air monitoring equipment in the FAP network was 99.2%. While the Alberta Government requires that monitoring equipment be fully operational a minimum of 90% of the time each month, FAP's internal uptime target is 98.5%.

Due to pandemic restrictions, Alberta Environment and Parks did not conduct a network audit in 2021.

EDUCATION AND AWARENESS

Campaigns Raise Awareness

- In 2021, FAP worked with other Airsheds across Alberta to launch a campaign discouraging the needless idling of vehicles. Research shows that reducing a vehicle's idling time to 60 seconds or less reduces negative impacts on air quality and the environment, plus saves fuel and money. In addition to public awareness, FAP gathered pledges from those who committed to turning off a vehicle if parked for longer than 60 seconds once the vehicle's interior is warm.

- We launched the fifth year of FAP's Fresh Air Experience social media campaign in May 2021. The campaign helped us expose air quality information to more than 63,000 people, and our Facebook followers increased to more than 12,000 during the month-long event.
- We participated with governments and organizations worldwide in promoting Clean Air Day on June 2, 2021. We encouraged Airshed residents to be **Clean Air Champions** and contribute to cleaner air by taking actions that help maintain and improve local air quality.

Provincial Collaboration Continues

FAP continues to collaborate with other Airsheds provincially as part of the **Alberta Airsheds Council** to implement successful air monitoring, reporting, and education within Alberta. Multi-stakeholder oversight of monitoring, data, and analysis through Alberta's Airshed organizations is critical to ensuring a credible, science-based approach to understanding air quality in Alberta. Stakeholders include all levels of government, industry, non-governmental organizations, and the public.

We actively participate in AAC policy and program development, with membership on AAC's Executive, Technical and Communications committees. In 2021, the Alberta Airsheds Council released a 2020 Alberta Airsheds Air Quality Report to summarize the air quality data monitored and collected in our province by Alberta's Airsheds. This report is available on **fortair.org**.

Designated Industrial Zone Pilot Project

In 2021, Alberta Environment and Parks (AEP), Alberta's Industrial Heartland Association, and the Northeast Capital Industrial Association continued to combine efforts to articulate what a Designated Industrial Zone (DIZ) concept could resemble in Alberta's Industrial Heartland.

The pilot objective is to establish a Designated Industrial Zone for Alberta's Industrial Heartland, which will create a unique regulatory framework that provides environmental standards; and certain and efficient approval processes that are best in class relative to competing international districts.

FAP actively participated in the Air Working Group of the Designated Industrial Zone Pilot Project throughout 2021. The focus of this working group is "defining environmental objectives for air quality, setting regional standards for ambient condition, identifying data gaps, and enabling shared knowledge." As part of supporting the Air Working Group, FAP also began work on a long-term monitoring plan, assessing how the current network may need to be expanded or revised to accommodate new development over the next several years.

FAP developed its previous monitoring plan in 2015. All projects approved in that plan are complete.

2021 MONITORING RESULTS

AIR QUALITY HEALTH INDEX RATINGS

Seven of FAP's 10 continuous monitoring stations collect data used to calculate an hourly and forecast Air Quality Health Index (AQHI) in and around Alberta's Industrial Heartland.

The Airshed experienced low risk AQHI ratings an average of 95% of the time in 2021, a one percent decrease from 2020. Among FAP's permanent stations, Elk Island had the most low risk ratings at 96.3% of the time, while Fort Saskatchewan had the fewest low risk ratings, at 92.9% of the time.

The number of high risk and very high-risk AQHI ratings increased significantly in 2021 compared to 2020. The increased number of high and very high AQHI ratings were almost entirely caused by wildfire smoke from outside the province, leading to poor air quality conditions during two significant episodes that occurred over six days in mid-July and again for two days in early October. While the low risk AQHI ratings remained fairly static from 2020, the number of hours experienced with high risk and very high risk AQHI increased compared to 2020.

In 2021, there were 297 hours of high risk and 84 hours of very high risk AQHI ratings. These hours were spread relatively evenly across FAP's continuous monitoring stations, illustrating the regional effect of wildfire smoke across the Airshed in July and October. By comparison, in 2020, there were only 16 hours of high risk and no hours of very high risk AQHI ratings. (Wildfire smoke was minimal in the FAP Airshed in 2020.)

FAP • 2021		AQHI Risk Level (% of time)			
Station Name	Hours Monitored	Low	Moderate	High	Very High
Bruderheim	8,448	93.84%	5.46%	0.53%	0.17%
Elk Island	8,418	96.34%	2.82%	0.64%	0.20%
Fort Saskatchewan	8,257	92.88%	6.20%	0.71%	0.21%
Gibbons	8,420	93.24%	6.13%	0.55%	0.08%
Lamont County	8,463	96.27%	3.19%	0.40%	0.14%
Redwater	8,140	95.48%	3.66%	0.65%	0.21%
Sturgeon County*	1,751	97.72%	2.28%	–	–
Town of Lamont**	2,872	98.19%	1.60%	0.21%	–
Totals Hours	54,769	52,008	2380	297	84

FAP • 2021		AQHI Risk Level (# of Hours)			
Station Name	Hours Monitored	Low	Moderate	High	Very High
Bruderheim	8,448	7,928	461	45	14
Elk Island	8,418	8,110	237	54	17
Fort Saskatchewan	8,257	7,669	512	59	17
Gibbons	8,420	7,851	516	46	7
Lamont County	8,463	8,147	270	34	12
Redwater	8,140	7,772	298	53	17
Sturgeon County*	1,751	1,711	40	–	–
Town of Lamont**	2,872	2,820	46	6	–
Total Hours	54,769	52,008	2,380	297	84

**The Keith Purves Portable station operated in Sturgeon County from January 1 to March 31, 2021.*
***The Keith Purves Portable reported AQHI in the Town of Lamont from August 20 to December 31, 2021.*

Hours with a High or Very High Risk AQHI Rating

This table shows the number of hours with a high or very high risk AQHI rating during the fourth quarter of 2021, when they occurred and the likely cause, when identifiable.

High Risk Very High Risk

	FAP Continuous Air Quality Monitoring Station															
Event Dates	Bruderheim		Elk Island		Ft. Sask.		Gibbons		Lamont County		Redwater		Keith Purves Portable*		Total Hours	Attributed Cause
January 29	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	Wintertime Inversion
April 16	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	Undetermined
July 9	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	Summertime Smog
July 9	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	Natural, Due to Wetlands
July 15 - 20	38	14	42	17	45	17	32	7	30	12	42	17	-	-	313	Wildfire Smoke
August 4 & 5	3	-	-	-	-	-	-	-	-	-	-	-	-	-	3	Summertime Smog
August 14	-	-	-	-	4	-	1	-	-	-	1	-	-	-	6	Wildfire Smoke
August 28	-	-	-	-	-	-	2	-	-	-	-	-	-	-	2	Undetermined
September 2 & 5	-	-	-	-	-	-	3	-	-	-	-	-	-	-	3	Undetermined
Sepiember 8	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	Natural, Due to Wetlands
October 5 & 6	4	-	11	-	10	-	6	-	4	-	6	-	6	-	47	Wildfire Smoke
October 31	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	Mulitple Sources
Total Hours	45	14	54	17	59	17	46	7	34	12	52	17	6	-	380	

* *The Keith Purves Portable Station reported the AQHI at the Sturgeon County site from January 1 to March 31 and in the Town of Lamont from August 1 to December 31, 2021.*

Summary of Exceedances

During 2021, there were 473 occurrences across FAP's ten monitoring stations where air quality measurements exceeded Alberta's Ambient Air Quality Objectives. This is compared to 33 exceedances in 2020. 94% of the exceedances that occurred in 2021 were due to increased levels of fine particulate matter from wildfire smoke.

Air quality measurements are compared continuously to both 1-hour and 24-hour Alberta Ambient Air Quality Objectives (AAAQO). Any exceedance of an AAAQO is reported to the Alberta Government and the cause of the exceedance is investigated.

One Hour AAAQO Exceedances – 2021

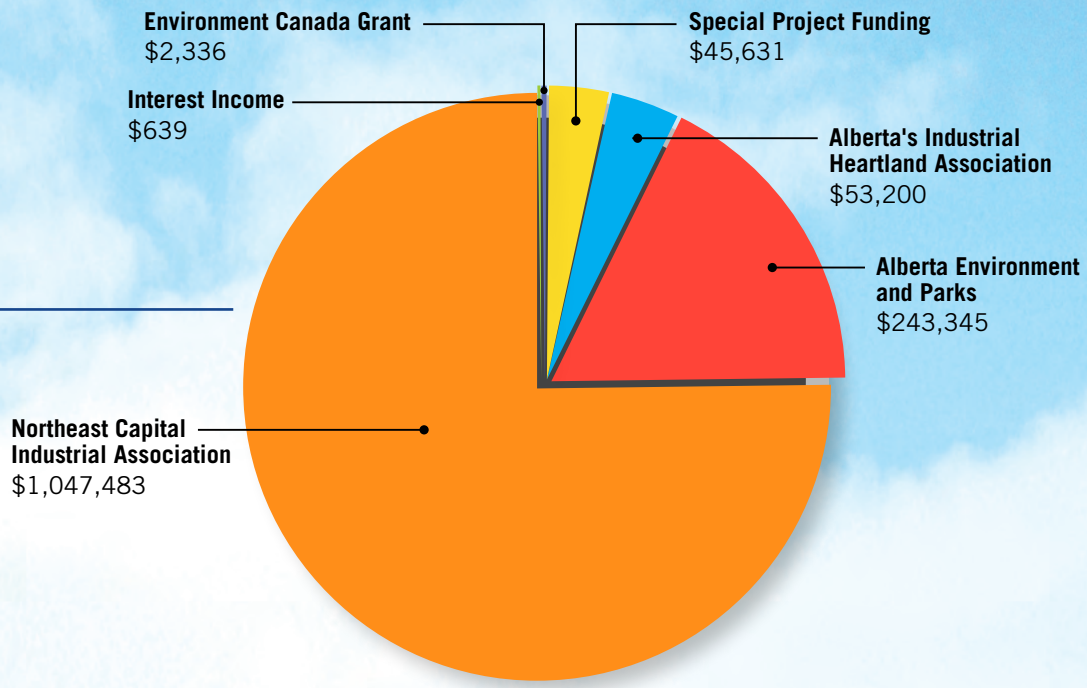
Parameter	Exceedances	Date	Attributed Cause
Fine Particulate Matter ($PM_{2.5}$)	1	January 29	Winter inversion
	1	April 16	Undetermined Cause
Hydrogen Sulphide (H_2S)	2	June 4	Natural Due to Wetlands
	2	June 27, 29	
Ozone (O_2)	3	July 8, 9	Summertime Smog
Fine Particulate Matter ($PM_{2.5}$)	328	July 15, 17-20, August 14	Wildfire Smoke
	3	August 28, September 5	Undetermined Cause
Hydrogen Sulphide (H_2S)	8	July 5, 9, 12, 28, 31	Natural Due to Wetlands
	4	September 8, 13, 29	
Fine Particulate Matter ($PM_{2.5}$)	59	October 5, 6	Wildfire Smoke
	1	October 31	Multiple Sources
Total Hours	412		

24 Hour AAAQO Exceedances – 2021

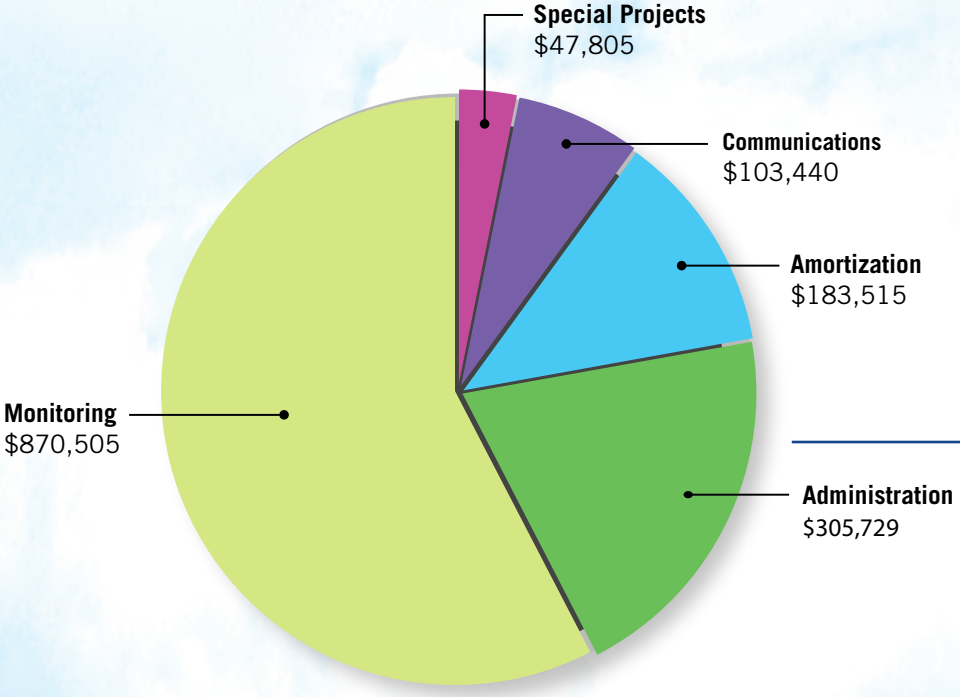
Parameter	Exceedances	Date	Attributed Cause
Fine Particulate Matter ($PM_{2.5}$)	2	January 29	Winter Inversion
	2	January 30	
	28	July 13-20	Wildfire Smoke
	18	August 1-3, 14, 15	
	10	October 5, 6	
Total Hours	60		

2021 FINANCIAL SUMMARY

REVENUE
$1,392,634



EXPENSES
$1,510,994



STATEMENT OF FINANCIAL POSITION

CURRENT		
Cash	$	318,982
GIC (wind-up reserve)	$	255,000
GIC (Special Projects)	$	87,947
GST Recoverable	$	19,099
Accounts Receivable	$	16,816
Prepaid Expenses	$	6,879
EQUIPMENT		
Air Monitoring and Computer Equipment	$	785,880
Total Assets	**$**	**1,490,603**
LIABILITIES		
Accounts Payable and Accrued Liabilities	$	182,670
Deferred Contributions	$	128,548
Long Term Deferred Contributions Related to Equipment	$	61,811
Total Liabilities	**$**	**373,029**
Net Assets	**$**	**1,117,574**

PEOPLE OF FAP

(as at December 31, 2021)

Board of Directors

Allan Wesley, M.A., B.Com., B.Sc.
(Chair) Public Member

Keith Purves
(Vice-chair) Public Member

Carrie Trenholm, LPN
(Treasurer) Public Member

Paula Horn, Dip.Chem.Tech.
(Secretary) Public Member

Deputy Mayor Daniel Skousbol
(Bruderheim)
Public Member (to October 2021)

Darcy Garchinski, MHA
Alberta Health Services

Ed McConaghy, B.Sc., C.Eng.
Public Member

Greg Poholka, P.Eng.
NCIA

Greg Piorkowski, PhD., PAg.
Alberta Environment and Parks

Kathleen Zellweger
Public Member

Laurie Danielson, Ph.D., P.Chem.
NCIA

Megan Wesley, P.Eng.
Public Member

Councillor Paul Smith
(Strathcona County)
AIHA (to October 2021)
Public Member (from October 2021)

Deputy Reeve Roy Anaka
(Lamont County)
AIHA

Stephanie Kozey, B.Sc.
NCIA

Tracey Hill
AIHA

Councillor Wayne Olechow
(Bruderheim)
Public Member (from October 2021)

Staff

Nadine Blaney, B.Sc.
Executive Director

Harry Benders
Network Manager

Godfrey Huybregts
ABC Communications Director

Alison Thiessen
Business Administrator

Technical Working Group

FAP's Technical Working Group provides overall direction in the implementation and operation of FAP's regional air monitoring network. The committee is supported by representation from industry, government and the public, which allows for equal, in-kind technical support.

Harry Benders
(Chair) FAP Network Manager

Patrick Andersen, B.Sc.
Andersen Science Consulting

Alicia Schweitzer, B.Sc., G.I.T.
NCIA

Chris Nayet, Dip. CET
Environment and Climate Change Canada

Clementina Okoro, P.Eng.
NCIA

Darcy Walberg
NCIA

Doug Hurl, CD, CRSP
NCIA

Farron Bibby
Alberta Environment and Parks

Gerry Mason, CRSP
NCIA

Gerry Zulyniak, P.Eng.
NCIA

Jeff Cooper, C.Tech.
WSP

Jocelyn Thrasher-Haug, M.Sc., P.Ag., P.Biol. Strathcona County

Karlee Searle
NCIA

Marianne Quimpere, B.Sc., EP
NCIA

Maurice Ouellet
NCIA

Maxwell Mazur, M.Sc.
Alberta Environment and Parks

Nadine Blaney, B.Sc.
FAP Executive Director

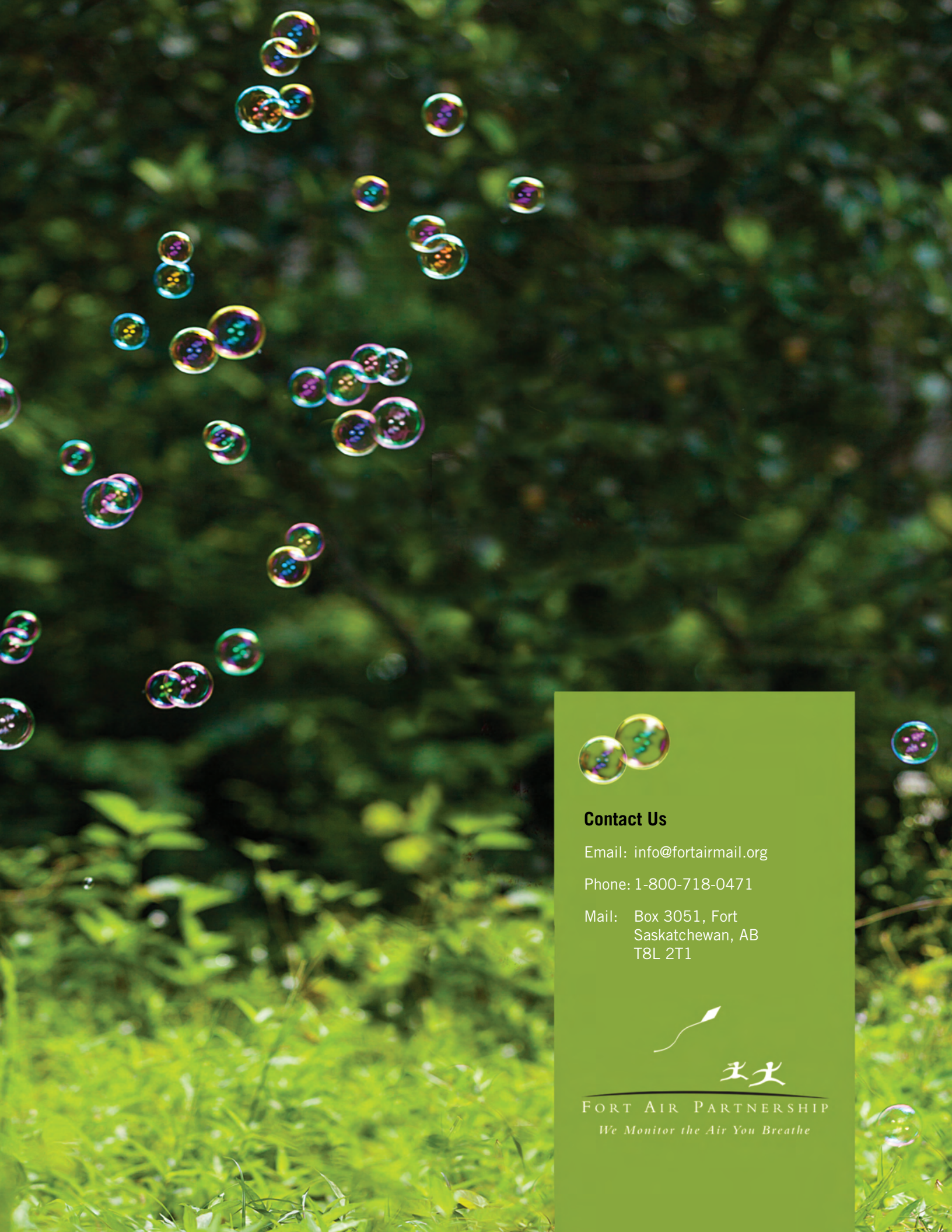
Scott Hillier
NCIA

Stephen Raye, BET (Environmental)
NCIA

Note:

AIHA = Alberta Industrial Heartland Association.

NCIA = Northeast Capital Industrial Association.



Contact Us

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