UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Form 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d)**
OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2022

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d)**
OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from _____ to _____
Commission file number: 001-36426

AquaBounty Technologies, Inc.

(Exact name of the registrant as specified in its charter)

Delaware	**04-3156167**
(State or other jurisdiction of incorporation or organization)	(I.R.S. employer identification no.)

2 Mill & Main Place, Suite 395
Maynard, Massachusetts 01754
(978) 648-6000

(Address and telephone number of the registrant's principal executive offices)

Securities registered pursuant to Section 12(b) of the Securities Exchange Act of 1934 (the "Exchange Act"):

Title of each class	Trading Symbol(s)	Name of exchange on which registered
Common Stock, par value $0.001 per share	**AQB**	**The NASDAQ Stock Market LLC**

Securities registered pursuant to Section 12(g) of the Act: **None**

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act of 1933.

Yes ☐ No ☒

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange Act.

Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Exchange Act during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or such shorter period that the registrant was required to submit such files).

Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☐ Accelerated filer ☐ Non-accelerated filer ☒ Smaller reporting company ☒ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report.

Yes ☐ No ☒

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

At June 30, 2022, the aggregate market value of the 65,320,863 shares of common stock held by non-affiliates of the registrant was approximately $111.7 million. At March 3, 2023, the registrant had 71,110,713 shares of common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for its Annual Meeting of Shareholders to be held on May 25, 2023 (the "2023 Proxy Statement"), are incorporated by reference into Part III of this Annual Report on Form 10-K.

ANNUAL REPORT ON FORM 10-K

FOR THE FISCAL YEAR ENDED DECEMBER 31, 2022

Table of Contents

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K, particularly the sections titled "Summary," "Risk Factors," "Management's Discussion and Analysis of Financial Condition and Results of Operations" and "Business," contains forward looking statements. All statements other than present and historical facts and conditions contained in this Annual Report on Form 10-K, including statements regarding our future results of operations and financial positions, business strategy, plans, and our objectives for future operations, are forward-looking statements. When used in this Annual Report on Form 10-K, the words "anticipate," "believe," "can," "could," "estimate," "expect," "intend," "is designed to," "may," "might," "plan," "potential," "predict," "objective," "should," or the negative of these and similar expressions identify forward-looking statements. These forward-looking statements include statements that are not historical facts, including statements regarding management's expectations for future financial and operational performance and operating expenditures, expected growth, and business outlook; the nature of and progress toward our commercialization plan; the future introduction of our products to consumers; the countries in which we may obtain regulatory approval and the progress toward such approvals; the volume of eggs or fish we may be able to produce; the timeline for our production of saleable fish; the expected advantages of land-based systems over sea-cage production; the validity and impact of legal actions; the completion of renovations at our farms; and the establishment of a larger-scale grow-out facility.

We have based these forward-looking statements on our current expectations, assumptions, estimates, and projections. While we believe these expectations, assumptions, estimates, and projections are reasonable, such forward-looking statements are only predictions and involve known and unknown risks, uncertainties, and other factors, many of which are outside of our control, which could cause our actual results, performance, or achievements to differ materially from any results, performance, or achievements expressed or implied by such forward-looking statements. Forward-looking statements in this Annual Report on Form 10-K include, but are not limited to, statements about:

- the anticipated benefits and characteristics of AquaBounty's genetically engineered Atlantic salmon ("GE Atlantic salmon" or "AquAdvantage salmon") product;
- the implementation and likelihood of achieving the business plan, future revenue, and operating results;
- our plans for (including without limitation, projected costs, locations and third-party involvement) and the timing of the development of new farms and the output of those farms (including our Pioneer, Ohio farm);
- developments concerning our research projects;
- our expectations regarding our ability to successfully enter new markets or develop additional products;
- our competitive position and developments and projections relating to our competitors and our industry;
- expectations regarding anticipated operating results;
- our cash position and ability to raise additional capital to finance our activities and the terms of such financing, including interest rates on debt;
- our ability to protect our intellectual property and other proprietary rights and technologies;
- the impact of and our ability to adapt to changes in laws or regulations and policies;
- the ability to secure any necessary regulatory approvals to commercialize any products;
- the rate and degree of market acceptance of any products developed through the application of bioengineering, including genetically engineered fish;
- our ability to retain and recruit key personnel;
- the success of any of our future acquisitions or investments;
- our estimates regarding expenses, inflation, future revenue, capital requirements, and needs for additional financing; and
- other risks and uncertainties referenced under "Risk Factors" below and in any documents incorporated by reference herein.

We caution you that the foregoing list may not contain all of the risks to which the forward-looking statements made in this Annual Report on Form 10-K are subject. We may not actually achieve the plans, intentions, or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions, and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included, particularly in the section titled "Risk Factors," that could cause actual results

or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures, or investments that we may make.

Given these risks and uncertainties, you are cautioned not to place undue reliance on such forward-looking statements. These forward-looking statements are made only as of the date of this Annual Report on Form 10-K. We do not undertake and specifically decline any obligation to update any such statements or to publicly announce the results of any revisions to any such statements to reflect future events or developments unless required by federal securities law. New risks emerge from time to time, and it is not possible for us to predict all such risks.

SUMMARY OF THE MATERIAL RISKS ASSOCIATED WITH OUR BUSINESS

Our business is subject to numerous risks and uncertainties that you should be aware of in evaluating our business, including those described in the "Risk Factors" section in Part I, Item 1A. of this Annual Report on Form 10-K. These risks and uncertainties include, but are not limited to, the following:

- We have a history of net losses and will likely incur future losses and may not achieve or maintain profitability.
- Our business plans include the need for substantial additional capital and without it we may not be able to implement our strategy as planned or at all.
- Recent increases in interest rates have increased our expected borrowing costs for the construction of our planned farm in Pioneer, Ohio, and may also affect our ability to obtain working capital through borrowings such as bank credit lines and public or private sales of debt securities, which may result in lower liquidity, increased expense and difficulty in financing our expansion plans, reduced working capital and other adverse impacts on our business.
- The financing of our Ohio farm through the placement of municipal bonds may require restrictive debt covenants that could limit our control over the farm's operations and restrict our ability to utilize a portion of any cash that the farm generates.
- Ethical, legal, and social concerns about genetically engineered products could limit or prevent the use of our products and limit our revenues.
- We may have limited success in gaining consumer acceptance of our products.
- Our business is affected by the quality and quantity of the salmon that we harvest.
- We may experience a significant fish mortality event in our broodstock or our production facilities that could impact the price of our common stock.
- A shutdown, material damage to any of our farms, or lack of availability of power, fuel, oxygen, eggs, water, or other key components needed for our operations, could result in our prematurely harvesting fish, a loss of a material percentage of our fish in production, a delay in our commercialization plans, and a material adverse effect on our operations, business results, reputation, and the value of our brands.
- Security breaches, cyber-attacks and other disruptions could compromise our information, expose us to fraud or liability, or interrupt our operations, which would cause our business and reputation to suffer.
- The successful development of our business depends on our ability to efficiently and cost-effectively produce and sell salmon at large commercial scale.
- Our ability to generate revenue to support our operations depends on maintaining regulatory approvals for our GE Atlantic salmon and our farm sites and obtaining new approvals for farm sites and the sale of our products in other markets, the receipt of which is uncertain.
- If our products become contaminated, we may be subject to product liability claims and product recalls, which could adversely affect our financial results and damage our reputation.
- The loss of our GE Atlantic salmon broodstock could result in the loss of our commercial technology.
- Business, political, or economic disruptions or global health concerns, such as the COVID-19 pandemic, could seriously harm our current or planned business and increase our costs and expenses.
- Industry volatility can affect our earnings, especially due to fluctuations in commodity prices of salmon.
- If we lose key personnel, including key management personnel, or are unable to attract and retain additional personnel, it could delay our commercialization plans or harm our research and development efforts, and we may be unable to sell or develop our own products.
- The price of our shares of common stock is likely to be volatile.
- Our share price and our ability to raise additional funds may depend on our success in growing, or our perceived ability to grow, our GE Atlantic salmon successfully and profitably at commercial scale.
- Atlantic salmon farming is subject to disease outbreaks, which can increase the cost of production and/or reduce production harvests.

The summary risk factors described above should be read together with the text of the full risk factors below, in the section entitled "Risk Factors" and in the other information set forth in this Annual Report on Form 10-K, including our financial statements and the related notes, as well as in other documents that we file with the U.S. Securities and Exchange Commission, or the SEC. If any such risks and uncertainties actually occur, our business, prospects, financial condition and results of operations could be materially and adversely affected. The risks summarized above or described in full below are not the only risks that we face. Additional risks and uncertainties not currently known to us, or that we currently deem to be immaterial may also materially adversely affect our business, prospects, financial condition and results of operations.

Where You Can Find More Information

We file with the Securities and Exchange Commission (the "SEC") periodic reports and other information, including our Annual Report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports. The SEC maintains an internet site at www.sec.gov that contains reports, proxy and information statements, and other information regarding issuers that file, as we do, electronically with the SEC.

All of these documents are available free of charge on our website, www.aquabounty.com, and will be provided free of charge to any shareholders requesting a copy by writing to: Corporate Secretary, AquaBounty Technologies, Inc., 2 Mill & Main Place, Suite 395, Maynard Massachusetts 01754, Telephone: (978) 648-6000. We use our website as a channel for routine distribution of important information, including news releases, analyst presentations, and financial information. In addition, our website allows investors and other interested persons to sign up to automatically receive e-mail alerts when we post news releases and financial information on our website. The information contained on, or accessible from, our website or in any other report or document we file with or furnish to the SEC is intended to be inactive textual references only, and is not incorporated by reference into this Annual Report on Form 10-K.

Part I

Item 1. Business

Overview

Feed a growing world by developing and deploying new aquaculture technologies.

At AquaBounty, our Purpose is to "Feed a growing world by transforming aquaculture through the use of technology, creating a safe, secure and sustainable future." We demonstrate our care for our people, our environment and our fish through our EPIC Values which include: "Excellence, Passion, Innovation and Collaboration". We believe we are a leader in the field of land-based aquaculture and the use of technology for improving its productivity and sustainability. Our objective is to ensure the availability of high-quality seafood to meet growing global consumer demand, while addressing critical production constraints in one of the most popular farmed species.

Aquaculture is the farming of aquatic organisms such as fish, shellfish, crustaceans, and aquatic plants. It involves cultivating freshwater or saltwater species under controlled conditions, as an alternative to the commercial harvesting of wild species of aquatic organisms. According to the Food and Agriculture Organization of the United Nations ("FAO"), aquaculture was a $265 billion industry in 2020, and we are targeting the $18 billion salmon farming segment of that industry.

We believe that AquaBounty has four core competencies that provide us with a competitive advantage over other land-based salmon farmers; our proprietary genetically engineered ("GE") Atlantic salmon, our experience operating land-based farms, our vertical integration, and our expertise in biotechnology.

Our GE Atlantic salmon is based upon proprietary salmon genetics and grows to harvest size faster, while consuming less feed, than conventional Atlantic salmon. With our salmon, we can produce more output at a lower cost in a land-based farm than with conventional salmon. Our GE Atlantic salmon was approved for production, sale, and consumption in the United States on November 19, 2015 by the U.S. Food and Drug Administration ("FDA"). This was followed by an approval from Health Canada for the production, sale, and consumption of our salmon in Canada on May 19, 2016 and an approval from the National Biosafety Technical Commission for the sale and consumption of our salmon in Brazil on May 12, 2021. Consequently, we have received approvals for our product from what we believe are three of the most respected and rigorous regulatory agencies in the world.

We farm our GE Atlantic salmon in land-based, recirculating aquaculture systems ("RAS"), which allow land-based fish farms to be established close to major demand centers in a profitable and environmentally sustainable manner. We have over 25 years of experience growing salmon in RAS farms, which are bio-secure, so we do not need to use vaccines or antibiotics to protect our fish. We control and optimize their living environment to promote their general health. By locating our farms near to major food markets, we reduce our transportation costs and carbon footprint.

We are vertically integrated and maintain our own broodstock hatchery, which produces the eggs that we grow-out to harvest size in our production farms. This hatchery also produces non-GE eggs for external sales.

We have our own research and development team with expertise in biology, chemistry and RAS operations. This allows us to continuously focus on improving the breeding, genetics and health of our fish and improving the efficiency of our farm operations.

We currently operate two salmon farms: a 1,200 metric ton production grow-out farm in Indiana and a broodstock farm on Prince Edward Island, Canada. Our plans include completing the construction of a new 10,000 metric ton production grow-out farm in Pioneer, Ohio and building additional production farms in North America at sites close to consumer consumption. We are also pursuing regulatory approval for our GE Atlantic salmon in Israel, with the goal of entering that market with a local partner in the form of a joint venture or licensing arrangement. Additionally, we plan to utilize our expertise in biotechnology and RAS operations to enter complimentary areas of the aquaculture industry, with an initial focus on shrimp.

Our strategy is to continually strengthen our core capabilities, scale our business and pursue growth opportunities.

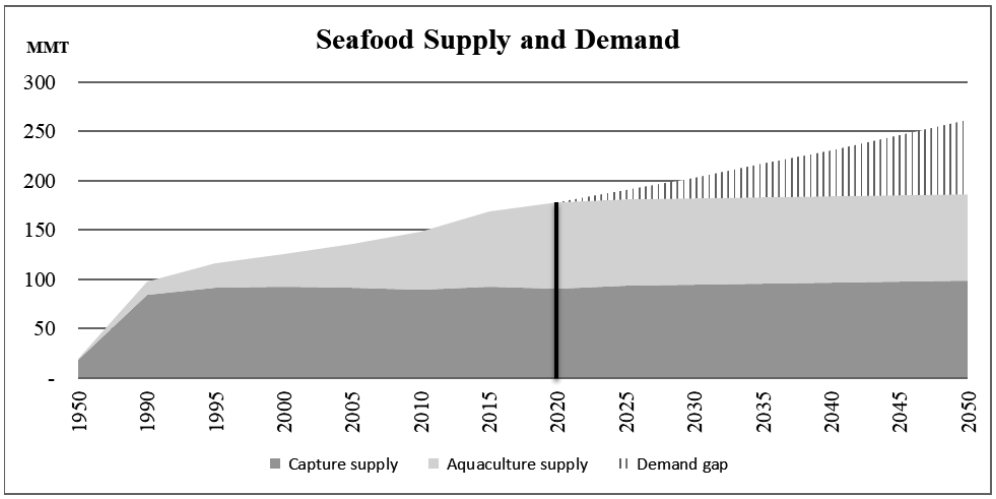
Market Drivers

Population Growth Drives Demand for Food Protein

According to FAO, the global population is projected to approach 9 billion people by 2050, or roughly 15% growth over the next 27 years. In addition to the increased demand for food from the rising population, increased incomes and urbanization from a growing middle class will drive increased demand for protein food sources. And according to FAO, global fish consumption has been growing faster than all other animal protein foods.

Traditional Fisheries Cannot Meet the Demand

The increased demand for fish protein cannot be satisfied from traditional capture fisheries. FAO states that over 90% of the world's fisheries are fully fished or overfished. Total production from global capture fisheries has been relatively stable since the late-1980s, with catches generally fluctuating between 86 million metric tons and 96 million metric tons per year, with 90 million metric tons recorded in 2020, the last year for which data is available from FAO. In contrast, over the same period, aquaculture fish production has grown from 14 million metric tons to a level of 88 million metric tons in 2020 and now accounts for 49% of global fish production. Feeding the growing population and meeting the demand for fish protein will require aquaculture production to nearly double by 2050. The chart below depicts the projected gap between supply and demand over the next 27 years.



Source: FAO - The State of World Fisheries and Aquaculture 2022 for actual data through 2020. Company estimates based on FAO data for projections through 2050.

Salmon Farming

Atlantic salmon farming is a major industry in the cold-water countries of the northern and southern hemispheres. According to Kontali, global tonnage of Atlantic salmon aquaculture production grew by approximately 6% annually between 2017 and 2021, reaching 2.6 million metric tons with a value of over $18 billion. We believe that the aquaculture industry – and in particular salmon farming – is poised for significant growth in the coming years, as the global population continues to expand and consumers seek out high-quality proteins.

Below is a break-down by major producing country for the time period 2017 through 2021, with estimated data for 2022 from Kontali.

Global Supply of Atlantic Salmon (in thousands of metric tons GWE)

Area	2017	2018	2019	2020	2021	2022 (Est)
Norway	1,087	1,128	1,200	1,232	1,379	1,360
Chile	508	594	621	701	646	644
United Kingdom	159	138	171	160	179	172
North America	143	149	142	141	145	139
Faroe Islands	72	65	78	73	95	91
Other areas	93	92	107	133	161	163
Volume-Worldwide	2,062	2,166	2,319	2,440	2,605	2,569

Source: Kontali

Limitations of Conventional Sea-Cage Salmon Farming

Conventional salmon aquaculture takes place in large cages (sea-cages) in coastal waterways exposed to currents, which can bring a variety of pathogens in contact with the farmed salmon. The presence of pathogens in an uncontrolled environment such as this is a universally accepted fact in human and animal health. Such disease agents in these uncontrolled water currents can result in infection and spread of infection within the captive population. The risks and outcomes of conventional, open sea-cage systems are well established, including the susceptibility to extreme weather conditions, and are often evidenced by outbreaks of a variety of bacterial and viral diseases as well as water fouling and contamination due to algal blooms and similar events. This risk of disease has led to the widespread use of antibiotics, vaccines, and other pharmacological agents.

The most prevalent disease and health management issues are infectious salmon anemia ("ISA") and sea lice. ISA is a viral disease in Atlantic salmon, and outbreaks have occurred in virtually every major salmon farming geography since 1984, including a major event in Chile in 2008 that impacted the country's production for three years. There is currently no effective treatment for the disease, and the salmon farming industry relies on health management practices to mitigate its impact. Sea lice are marine parasites that occur naturally and attach to the skin of Atlantic salmon. Even a few sea lice can increase the likelihood of secondary infections and mortality, and the presence of significant numbers are likely to have adverse effects on fish health and aesthetic appearance. The cost of managing sea lice in sea-cage farming environments can be significant. Other viral diseases such as Salmonis Piscirickettsia ("SRS") continue to present significant challenges in Chile while new emerging diseases caused by viruses including heart and skeletal muscle inflammation ("HSMI"), and cardio myopathy syndrome ("CMS") are on the rise in Norway.

Another limitation of the conventional salmon production system is that the farms are not located near the ultimate consumers and thus an additional carbon footprint is created in transporting the fish from its production to its consumption location.

We believe we offer a better, more sustainable alternative to conventional salmon production.

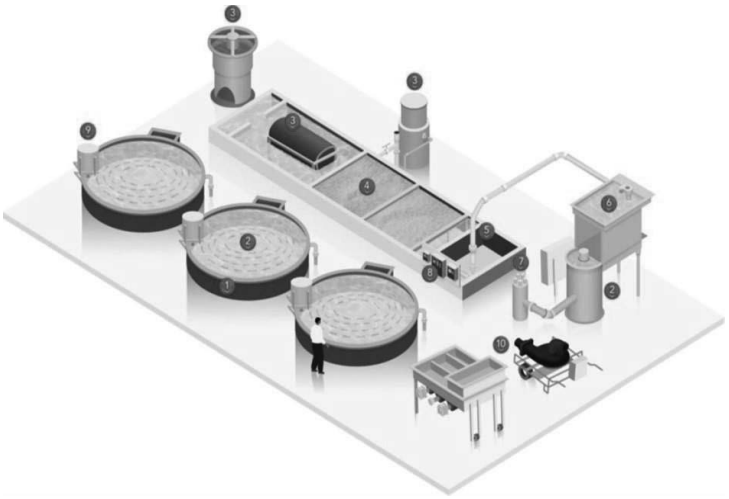
AquaBounty Solution

Land-Based RAS Production

The closed, contained, land-based production systems using RAS technology that we use for the grow-out of our fish are less susceptible to the disease-related pressures of conventional salmon farming, because this type of culture system is isolated from the environment. RAS facilities employ sophisticated water treatment technology including the use of ozone, salt treatment and ultraviolet radiation to kill potential bacterial, fungal, or viral pathogens which might enter the system. In addition, incoming water is similarly filtered and treated prior to entering the system, and water quality is regularly measured as part of the standard procedures. The fish in RAS facilities are generally not vaccinated against typical fish diseases, and no antibiotics, pesticides, or pharmacological agents are typically required. RAS facilities employ effective biosecurity to prevent disease by reducing or eliminating the introduction of pathogens and continuously treating the water to assure optimal fish health. RAS production allows our fish to be raised in optimized conditions with total control of the water coming in and going out of the system, while recirculating greater than 95% of the water used. Further, stocking our RAS farms with disease-free eggs from our own hatchery results in a much higher degree of biosecurity and protection from disease.

In addition to biosecurity measures to optimize fish health, our farms feature multiple layers of containment designed to prevent escapes. We have been growing fish in RAS facilities for decades and we have never experienced an escape. The multiple layers of containment redundancy, coupled with the fact that our salmon are sterile female fish, pose a much-needed solution to raising fresh, healthy seafood in a manner that prevents harming native fish populations. The method of land-based fish farming that we employ has been promoted by many environmental NGOs and it does not pose a threat to wild salmon populations.

We have significant experience in operating land-based RAS facilities. Our operating practices and procedures have been developed and honed over two decades and are geared towards meeting stringent regulatory requirements. Our experience operating land-based RAS salmon farms enables us to protect both the fish and the environment.



1. Fish culture tanks
2. Tank emergency aeration
3. Microscreen filter (solids filtration
4. Protein skimmer (fine solids filtration)
5. MBBR (biofiltration)
6. Pumping system
7. CO2 degassing (gas management)
8. Oxygen injection gas management)
9. Ozone disinfection (WQ control)
10. UV disinfection

Source: Innovasea

Our GE Atlantic Salmon

Our GE Atlantic salmon program began over 30 years ago and is based upon a single, specific molecular modification in our salmon that results in more rapid growth during early development. The result is a genetically engineered Atlantic salmon that can grow to market size faster than a conventional farmed Atlantic salmon.

The original research on the Atlantic salmon was conducted at Memorial University in Newfoundland, Canada, by a team seeking to protect the fish from the effects of the cold waters of the North Atlantic Ocean. They discovered that the single genetic change made by placing a second copy of the salmon growth hormone gene under the control of an alternative genetic promoter (gene switch) from the ocean pout resulted in more consistent levels of growth hormone being released, which accelerated the early stages of the salmon's development, a time period when the salmon are more susceptible to disease and mortality. The accelerated growth allows these fish to reach a marketable size sooner. This can reduce farming time in a RAS facility from roughly 26 to 28 months for conventional Atlantic salmon to roughly 18 to 20 months for our salmon.

This accelerated growth has economic and environmental advantages. The faster life cycle from hatch to harvesting of our salmon, as compared to conventional salmon, allows it to be produced more economically in contained, land-based RAS farms. Although RAS farms require greater capital investment than the sea-cage approach, we believe that the higher costs are offset by more efficient growth and a shorter transportation distance to market. Compared to conventional salmon grown in a RAS farm with a similar capital investment, we can produce approximately 70% more of our GE Atlantic salmon each year. Our fish are also 25% more efficient at converting their feed to biomass, which represents a significant cost advantage as feed is the largest variable cost of growing salmon. Further, locating our farms nearer to major food markets allows us to realize savings on transportation of the harvested stock, while maintaining a reduced carbon footprint, and an improved ability to get fresh product to market faster.

Intellectual Property

Our GE Atlantic salmon is based upon a single, specific molecular modification in the fish that results in more rapid growth in early development. The patent for the underlying technology, which had been issued in certain salmon producing countries, expired in August 2013 and we currently hold a global, perpetual, royalty-free, fully paid, sub-licensable, assignable, non-exclusive right to the technology covering genetically engineered salmonid fish that express endogenous growth hormone under the control of a protein gene promoter from an edible fish. Despite the expiration of the patent for the licensed technology, we believe that the degree of know-how in the molecular modification process and the regulatory timescales associated with approval of genetically engineered fish present significant barriers to entry and a competitive advantage.

We rely on a combination of patent, trademark, and trade secret laws in the United States and applicable foreign jurisdictions, as well as confidentiality procedures and contractual provisions, to protect our proprietary technology, processes, and brand. In December 2015, we were granted a U.S. patent for our molecular sterility system, which renders sterile the progeny of any female fish carrying a defined maternal sterility gene. Subsequently, the maternal sterility patent has been issued in Australia, Brazil, Canada, Chile, Japan, and the Republic of Korea. While the technology described in the sterility system patent is not required under any of our current regulatory approvals, the technology may be desirable in the future to obtain or maintain regulatory approvals.

Regulatory Aspects of Genetically Engineered Fish

The genetic engineering of food using the tools of modern biotechnology is regulated in the United States by two government organizations, the U.S Department of Agriculture ("USDA") for genetically engineered plants and the FDA for genetically engineered animals.

The regulatory process for genetically engineered food and animal feed is based upon the Coordinated Framework, issued by the Office of Science and Technology Policy in 1986, but the enabling legislation is the Federal Food, Drug, and Cosmetic Act ("FFDCA"). The FDA is also required to determine the environmental impact of a proposed application under the National Environmental Policy Act ("NEPA"). In the case of animals intended for food or materials for feed, the FDA process is a pre-approval review followed by an approval if the application is acceptable under the relevant legislation, with ongoing oversight following approval.

We opened an Investigational New Animal Drug file for AquAdvantage salmon with the FDA in 1995. At that time, there was no defined regulatory framework for the regulation of bioengineered animals. There were, however, certain studies that were generally acknowledged to be necessary for an eventual approval process. We commenced work on those studies and began a phased submission of studies to the FDA that ultimately was responsive to each technical section of the New Animal Drug Application ("NADA"). These technical sections require submission of studies relating to molecular characterization of the construct; molecular characterization of AquAdvantage salmon lineage; phenotypic characterization of AquAdvantage salmon; a genotypic and phenotypic durability plan; support for environmental, food, and feed safety; and claim validation. The FDA's phased review process, which included a cycle of study conduct, submission, review, and acceptance, continued over the period from 1995 to 2010. Following this process, the FDA concluded that AquAdvantage salmon "is as safe as food from conventional salmon, and that there is a reasonable certainty of no harm from consumption of food" from AquAdvantage salmon. On November 19, 2015, the FDA issued an approval letter for the NADA for AquAdvantage salmon, along with a final Environmental Assessment ("EA") and a finding of No Significant Impact on the EA under NEPA.

Regulatory Legal Challenge

On March 30, 2016, a coalition of non-governmental organizations ("NGOs") filed a complaint in the United States District Court for the Northern District of California against the FDA, the United States Fish and Wildlife Service, and related individuals for their roles in the approval of AquAdvantage salmon. Subsequently, AquaBounty joined the case as an intervenor to protect our interests. Shortly thereafter, the Fish and Wildlife Service was dismissed from the case. The NGOs, including the Center for Food Safety and Friends of the Earth, claimed that the FDA had no statutory authority to regulate genetically engineered animals, and, if it did, that the agency failed to adequately analyze and implement measures to mitigate ecological, environmental, and socioeconomic risks that could impact wild salmon and the environment, including the risk that AquAdvantage salmon could escape and threaten endangered wild salmon stocks. In December 2019 the court found that the FDA did have authority/jurisdiction over genetically engineered animals under the FFDCA, and in November 2020, the court remanded the EA to the FDA for further work on its NEPA and Endangered Species Act ("ESA") assessments. In December 2020, the plaintiffs filed a motion to alter or amend the judgment. In February 2021, the judge denied that motion. The court's decisions do not have a current business impact on AquaBounty's egg production on Prince Edward Island, Canada or AquaBounty's salmon production in Albany, Indiana. AquaBounty is working with the FDA on the NEPA and ESA regulatory matters.

On-going Regulatory Requirements

In addition to the FDA approval of the NADA for AquAdvantage salmon, our operating sites in the United States and on Prince Edward Island, as well as those we plan to operate in the future, must be registered with, and periodically inspected by, the FDA as drug manufacturing establishments. Drug manufacturing establishments that supply FDA-regulated products for use in the United States must comply with the product's conditions for approval, whether located in the United States or in a foreign country. Each of our operating sites in Indiana and on Prince Edward Island, is currently registered with the FDA, and the FDA has performed inspections and site visits at each of those facilities.

Going forward, we must continue to comply with FDA requirements not only for manufacturing, but also for labeling, advertising, record keeping, and reporting to the FDA of adverse events and other information. We also need to comply with USDA disclosure requirements pertaining to bioengineered foods under the National Bioengineered Food Disclosure Law. Failure to comply with these requirements could subject us to administrative or judicial enforcement actions, including but not limited to product seizures, injunctions, civil penalties, criminal prosecution, refusals to approve new products, or withdrawal of existing approvals, as well as increased product liability exposure.

Production of AquAdvantage salmon in the United States also requires compliance with environmental regulations and local site permitting statutes. In addition, every production site for AquAdvantage salmon in the United States requires approval by the FDA of both a Supplemental NADA and satisfaction of corresponding obligations under NEPA, as well as compliance with local permitting requirements for construction of grow-out facilities. We expect that we may incur significant costs to comply with these environmental and regulatory requirements, which could be a multi-year process to complete for each production site, though conducted in parallel with our construction timelines.

Labeling and Disclosure Standard

There have been surveys cited by various NGOs that indicate that consumers are reluctant to purchase genetically engineered food and that they would like to see labeling in order to avoid it. Many states reacted to this by enacting genetically engineered food labeling laws. Consequently, in response to the potential for state-by-state labeling laws, Congress passed the National Bioengineered Food Disclosure Law ("Disclosure Standard") in 2016, which directed USDA to establish a national mandatory standard for disclosing foods that are or may be bioengineered. The Disclosure Standard requires food manufacturers, importers, and certain retailers to ensure bioengineered foods are appropriately disclosed. The Disclosure Standard came into effect on January 1, 2022, but we began complying in 2021 on a voluntary basis when our salmon began to be harvested and sold.

In conjunction with the bioengineered disclosure, we also have begun to educate consumers on the benefits of our GE Atlantic salmon versus conventional Atlantic salmon, including its 25% improved feed conversion (meaning less feed is needed to produce the same harvest), a lower carbon footprint due to local production, reduced impact on the environment, reduced exposure of the fish to environmental toxins due to use of land-based aquaculture systems, and reduced reliance on vaccines or antibiotics due to improved biosecurity.

In December 2019, the 2020 Appropriations Act was signed into law, which was reintroduced and passed in 2021 and 2022, which contained an amendment that requires that any genetically engineered animal approved by FDA prior to the effective date of the Disclosure Standard shall include the words ‘‘genetically engineered’’ prior to the existing acceptable market name. While we believe that this labeling requirement is unnecessary and redundant to the requirement of the Disclosure Standard, we have and will continue to comply with all applicable laws.

Our compliance with these laws and regulations may be onerous and could increase our cost of doing business, impact our competitive position relative to our peers or otherwise have an adverse impact on our business, reputation, financial condition and operating results. For more information about government regulations applicable to our business, refer to "*Risk Factors*" in Item 1A.

U.S. Market

According to Kontali, in 2020 the supply of Atlantic salmon to the U.S. market reached a record 1.24 million pounds (563 thousand metric tons) with an aggregate market value of over $4.5 billion. The vast majority of the imported Atlantic salmon originated from Chile, Canada, and Norway. The Atlantic salmon farming industry in the United States contracted significantly beginning in the 1990s in the face of environmental concerns and lower costs of production from foreign sources, notably Chile. According to Kontali, a total of only 20 thousand pounds (9 thousand metric tons) of farmed Atlantic salmon was produced in the United States in 2020, representing less than 2.0% of the total farmed Atlantic salmon supplied to the country.

Supply of Atlantic salmon to U.S. market in thousands of metric tons (wfe)

Area	2014	2015	2016	2017	2018	2019	2020E
Canada	55	93	101	92	91	92	93
Chile	215	224	217	220	267	284	325
Faroe Islands	17	15	17	15	13	19	14
Norway	40	51	56	68	67	68	68
United Kingdom	20	16	13	18	16	20	12
USA - own production	16	14	8	13	7	8	9
Other countries	11	15	16	20	23	30	42
Total	374	428	428	446	484	521	563

Source: Kontali

Despite intensive public consumer education campaigns promoting its health benefits, seafood consumption in the United States still lags behind other protein sources and trails consumption in overseas markets. According to the USDA, during the period from 2013 to 2018, annual seafood consumption in the United States ranged between 14 and 16 pounds per capita, significantly behind consumption

of poultry (70 to 78 pounds), beef (51 to 55 pounds), and pork (43 to 47 pounds). In comparison, according to FAO, average seafood consumption worldwide was 45 pounds per capita in 2018.

Consumer Sentiment Regarding Genetically Engineered Fish

Though Atlantic salmon is the second most consumed seafood in the United States, activist groups opposing genetically engineered foods have pressured a number of distributors, food service operations, retail food outlets and grocery chains to publicly state that they will not carry genetically engineered salmon.

However, currently we do not expect that this will have a significant impact on overall consumer demand and product placement in the marketplace generally, and in particular the wholesale marketplace. To date, large wholesalers have not followed the example of these distributors, food service operations and retailers, and we have sold our GE Atlantic salmon from both our Indiana and Prince Edward Island farms since commencing harvesting in May 2021. We believe that there will be sufficient demand from smaller retailers, wholesalers, and institutional seafood buyers to absorb our projected production. We believe that the FDA approval reinforces the message that our salmon is a safe and nutritious seafood product that is identical to conventional farmed Atlantic salmon.

Consumer sentiment towards genetically engineered foods is evolving. Based on market research that we commissioned, the top attributes for consumer selection of farm-raised salmon are availability, affordability, freshness, safety, and taste. According to the poll conducted, 53% of respondents had a first impression of genetically engineered food that was neutral to very positive; 60% were neutral to very likely to purchase genetically engineered products they buy regularly if labeled as such; 70% were neutral to very likely to purchase genetically engineered products they buy regularly if labeled with the USDA Bioengineered Disclosure Symbol; 81% were neutral to very positive to the AquaBounty and our GE Atlantic salmon story and product benefits; and 70% were likely to purchase and try our salmon at least once.

According to a study conducted by the Boyce Thompson Institute, which looked at the number and tone of over 100,000 online and print articles published in top-ranked media between 2018 and 2020 as well as 1.7 million social media interactions, the overall tone of the conversation on GE foods is "surprisingly positive, averaging 73% favorable if neutral and positive reporting are combined." The positive reporting became more favorable over the time period studied. Their findings suggest a drop in the importance of GE, with a more favorable and less polarized conversation across the globe.

Sales Plan

The salmon distribution system in the United States is complex and varied. Participants include fishermen, fish farmers, processors, importers, secondary processors, broadline distributors, specialty seafood distributors, brokers, traders, and many different kinds of retail and food service companies. Salmon distribution channels are evolving, with fewer and larger distributors handling an increasing share of total volume and an increasing share of salmon being sold directly by large fish-farming companies and large wild salmon processors to major retail and food service chains. Our GE Atlantic salmon is currently being sold into this distribution network with an initial focus on seafood distributors and wholesalers. This is due to our limited supply of fish, which necessitates our being selective in bringing on new customers. We expect that once our Ohio farm is in commercial operation, we will be able to expand our customer depth and breadth and increase our channel coverage.

As a commodity food item, the price of Atlantic salmon is variable based on the supply and demand for product weekly. We base our pricing on a published index by Urner Barry, which provides comprehensive market coverage across all major center-of-the-plate food proteins, taking into account differences for fish size and quality.

Competition

The global Atlantic salmon farming industry includes several very large companies with operations in each of the major producing countries. Consolidation has been evident in the past few years as producers attempt to gain competitive cost advantages while overcoming the regulatory challenges associated with developing new marine farm sites. Major market producers include the following companies: Mowi, Aquachile, Leroy Seafood Group, Mitsubishi/Cermaq, SalMar, Cooke Aquaculture, Multiexport and Bakkafrost. It is estimated that these eight companies accounted for approximately 49% of the Atlantic salmon produced in 2020. Since salmon is primarily sold as a commodity in the United States, we compete against these well-established, sea-cage production companies.

In addition, new entrants to salmon production have emerged that use, or plan to use, land-based RAS facilities. Atlantic Sapphire is operating a ten thousand metric ton facility in Florida, with stated plans to increase production to over 220 thousand metric tons. Other entrants include Nordic Aquafarms, with plans for facilities in Maine and California, and Whole Oceans with plans for a farm in Maine.

Operations

Current Production

We currently operate two salmon farms: a refurbished 1,200 metric ton production grow-out farm in Indiana and a broodstock farm on Prince Edward Island, Canada. Our first harvests of conventional salmon in Indiana commenced in June 2020 and our first harvests of our GE Atlantic salmon commenced in June 2021 at both of our U.S. and Canadian farms. During 2022, we transitioned the grow-out operation at the Canadian farm to egg production. At December 31, 2022, we had a total grow-out production biomass of 492 metric tons.

Impact of COVID-19 and Supply Chain, Labor Market and Transportation Challenges

Although the COVID-19 pandemic has diminished in the United States and other parts of the world as vaccines have become more readily available, variants of the virus continue to spread. Local governmental authorities in the United States and Canada have issued, and continue to update, directives aimed at minimizing the spread of the virus and the Company continues to monitor their status. At least in part due to the pandemic, we have experienced delays and cost increases in capital projects, additional challenges in our efforts to meet the capacity expectations at our existing facilities and continue to experience extended lead times on equipment purchases. We may continue to experience delays and cost increases on farm construction, purchases of capital equipment and supplies and other materials required in our operations due to vendor shortages and labor shortages. We expect to continue to be impacted by transportation or supply chain disruptions to our partners or customers and we are carefully managing and monitoring the impact of labor shortages on our ability to meet the annual capacity expectations at our existing facilities.

Impact of Inflation

Recent increases in global inflation rates have impacted all areas of our business. We are experiencing higher costs for farming supplies, transportation costs, wage rates, and other direct operating expenses. Additionally, inflation has impacted the total project cost estimate for our Ohio farm, which has increased to a range of $375 million to $395 million. We expect inflation to continue to negatively impact our results of operations for at least the near-term.

North America Plan

Our longer-term business plan contemplates that we will construct and operate several new, land-based RAS farms in North America at locations close to consumer consumption. Our target is to achieve an annual production output of 50,000 metric tons within the next ten years.

During 2021, we selected Pioneer, Ohio as the site location for our first 10,000 metric ton farm. Based on the engineering design that has been completed, we have estimated that the project, which includes a roughly 479,000 square foot facility, land, insurance and other ancillary items will cost between $375 million and $395 million. We have commenced site construction activities and our targeted timeline for the introduction of our first batch of GE Atlantic salmon eggs is the end of 2024, pending the required facility approval by the FDA. Our plan to finance the construction of the farm includes both equity and debt components. In October 2022, the Board of Directors of the Toledo-Lucas County Port Authority approved the issuance of up to $425 million in municipal bonds for our project. We are currently proceeding with the bond financing and targeting to close the transaction in mid-2023.

The work that we have done to date on the design of the Ohio farm will serve as a template for future farm projects, though we will continue to incorporate the learnings from our current farm operations and our philosophy of continual improvement. The picture below shows a design rendering of the inside of the farm.

Source: AquaBounty

Egg Production

We have scaled-up our egg production capability at our Fortune and Rollo Bay hatcheries on Prince Edward Island and we can now produce over 10 million eyed eggs annually, which is more than our current internal demand. As there is a shortage of supply of salmon eggs in the market, we have begun to sell our excess conventional ("non-transgenic") salmon eggs and fry to other salmon farmers. We also made the decision to transition the grow-out operation at our Canada farm to egg production in order to increase our egg production capacity over the next four years to 30 million eyed eggs annually, which would be sufficient to stock six 10,000 metric ton farms.

International Plans

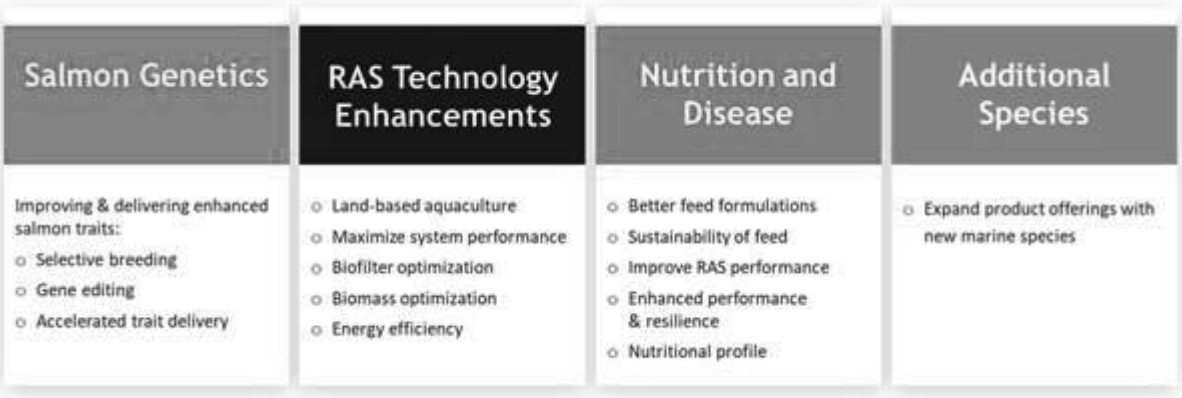
While our primary focus is on North America, we also plan to expand internationally, targeting those markets that are net salmon importers, unable to supply their domestic needs and where we believe we will have success in gaining further regulatory approvals and consumer acceptance. Once approved in these locations, we plan to commercialize through a combination of partnerships, joint ventures, and licensing arrangements. Consequently, we have targeted Brazil, Israel and China as potential markets. In Brazil, we have received approval for the sale and consumption of our fish, and we are now seeking to identify a local partner. In Israel, we have selected a partner and we are preparing our regulatory application. In China, we have paused our efforts to conduct field trials until we have greater certainty of both the regulatory and political landscape.

Growth Strategy

Optimizing Technology and Innovating for the Future

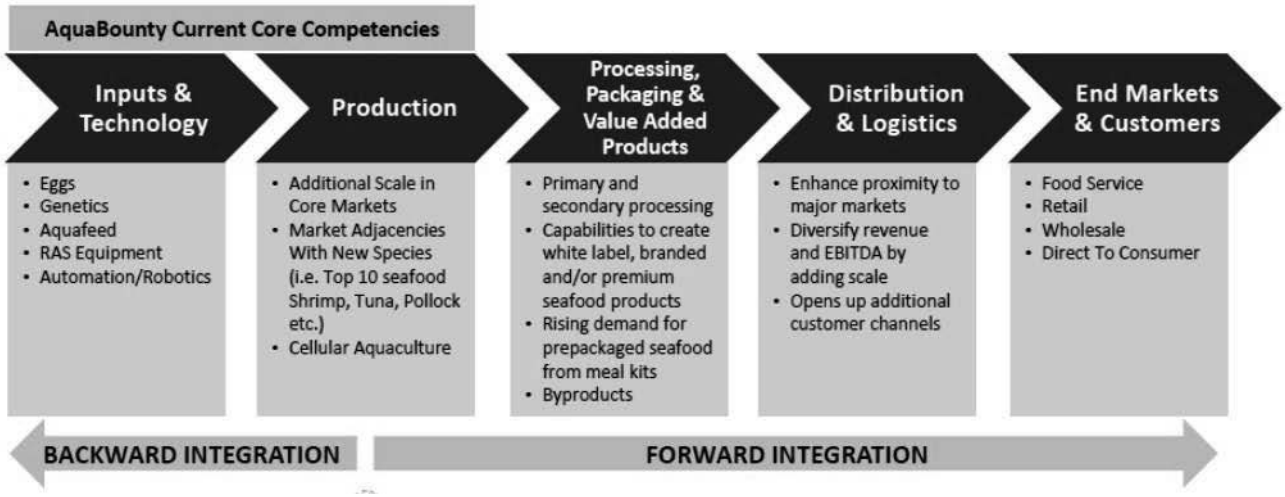
We are exploring the potential development of a range of additional products, including a second generation of our GE Atlantic salmon to help ensure 100% sterility, molecular sterility systems to provide an improved means of sterility for farmed fish, and improved methods for generating genetically engineered fish.

Our primary research and development operations are located in our owned hatcheries on Prince Edward Island. As of December 31, 2022, we employed 36 scientists and technicians to oversee our broodstock, as well as the lines of fish we maintain for research and development purposes. In addition, we contract some research activities to third parties. In the future, we may enter into other partnerships and collaboration agreements to advance our research and development efforts.



Vertical and horizontal integration

We may have multiple opportunities to vertically integrate and strategically increase our value-added capabilities within the seafood industry. These capabilities can be obtained by building and developing in-house, forming partnerships, direct investment or through acquisition.



We could also seek to expand our production capabilities in adjacent markets, including:

- Diversify into additional high value species such as shrimp, trout, or tuna.
- Evaluate markets for inputs and by-products such as animal feed, fish meal and fish oil.
- Acquire new production technologies such as cellular aquaculture in the rapidly growing bio-engineered food market.

Human Capital Resources

We believe in the positive impact that a team-based management structure delivers. We empower our people by placing decision making power at the team level; driven by those closest to the work. We provide training opportunities to our teams to continually improve their decision-making skills. Our recent development initiatives included introduction to lean and continuous improvement, leadership coaching skills, goal setting and coaching performance, creation of detailed work instructions and operations training based upon our standard operating procedures. We believe such initiatives ensure our team's alignment with our company's expectations, and when coupled with our confidence in our people's abilities, our team is positioned to succeed.
As of December 31, 2022, we had 100 team members, 70 of which were in our farm operations and 12 in research and technical support functions. As of December 31, 2022, we had 18 corporate team members who provided support to all of our operations and were responsible for the execution of all corporate functions, including executive, operational, finance, information technology, legal, and corporate communications. None of our team members are represented by a labor union, and we consider our employee relations to be good.

We structure our compensation packages to compete for the best talent. Our compensation packages include a competitive base salary and health and wellness benefits, along with a retirement plan that includes a Company match.

ESG Leadership

We view the focus on Environmental, Social and Governance ("ESG") concerns as foundational to a well-run business and fundamental to our Purpose and Values, as well as a critical aspect of how we operate our business, deliver results and drive continuous improvement. We embraced ESG early in the development of our business practices, as we see it as a critical component to building our culture and as a strategic imperative for identifying increased efficiencies and effectiveness as we grow. The ESG reporting requirements will continue to evolve and we will continue to monitor those changes. We believe taking ESG considerations into account in our decision-making process ensures a disciplined approach to risk management. Our ESG Committee, comprised of our executive management team with oversight by our Board of Directors, has worked cross functionally to develop our strategy, structure, processes and the roadmap for the standards that are relevant to our business.

In 2021, we took an important step in our corporate governance evolution by committing to deeper understanding of material non-financial matters of our business across environmental, social, and governance aspects. We deployed a rigorous process where we identified and interviewed external advisors/consulting groups that would provide expertise to assist in developing and implementing our ESG initiatives and selected a qualified strategic counsel and partner. We also identified and implemented a digital system platform to track data inputs used for reporting calculations and to ensure we are collecting data and other ESG inputs on a consistent and ongoing basis.

Following a thorough review of the various ESG reporting standards, we selected the SASB Framework as our primary standard, as the accounting metrics for the Food Sector contain topics that are more specific and pertinent to our business model and operations during the current reporting period. Additionally, our program and reporting incorporates alignment with several applicable GRI metrics and the United Nations Sustainable Development Goals ("UNSDGs").

In our initial ESG materiality assessment we chose to focus on the following aspects:

Environmental

Energy Management

Our current operating farms utilize energy from the grid, but we are acutely aware of the need to diversify into green energy sources for existing facilities, as well as incorporate alternative energy sources for future farming operations . We are evaluating various alternative energy sources, from constructing our own green energy facilities to purchasing green energy through purchase power agreements (PPA). Onsite renewable options being considered include photovoltaic (PV) solar technology, wind turbine generator (WTG) technology (large/small), and battery energy storage system (BESS) technology.

Greenhouse Gas Emissions

We are currently collecting, monitoring, and managing data on a monthly basis that supports our Scope 1 and Scope 2 (both defined below) emission inventory. Our carbon footprint for the year ended December 31, 2022 is as follows:

- Our Total Scope 1 and Location-Based Scope 2 emissions amounted to 7,698 metric tons of CO2e. We did not have any eligible offsets. Of that,

- GHG Emissions: Scope 1 emissions – 2,986 metric tons of CO2e

  We define Scope 1 emissions in accordance with The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD). The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF6), and nitrogen trifluoride (NF3). GHGs are reported here on a gross basis, i.e., not accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for our emissions.

  Our Scope 1 emissions comprise approximately 39% of our total Scope 1 and 2 emissions, with natural gas for furnace and heating equipment contributing approximately 2,177 metric tons of CO2e or 72.9% of the total Scope 1 emissions. The rest of the Scope I is attributable to furnace oil (7%), refrigerants (16%), diesel (2%), and other de minimis inputs. Our mobile combustion and fugitive emissions are responsible for approximately 17% of Scope 1 and 7% of total Scope 1 & 2 emissions, respectively.

- GHG Emissions: Scope 2 emissions – 4,712 metric tons of CO2e, which equates with SASB reporting requirements to 38,559, Gigajoules (GJ). Purchased electricity is responsible for 61% of the total Scope 1 and 2 emissions generated by our company. The scope of energy consumption includes energy purchased from various sources and directly consumed by our operations during the calendar year 2022, such as energy purchased from energy companies in the U.S. and Canada: fuel, electricity, heating, and cooling. We do not have self-generated or green-sourced energy at this time. In calculating energy consumption from various fuels, we used conversion factors from the EPA and higher heating values (HHV) from the U.S. Department of Energy (DOE) and the U.S. Energy Information Administration (EIA).

  We calculate our Scope 2 emissions based on a location-based method utilizing eGRID Subregion RFCW (RFC West) factor for Indiana and AKMS (ACSS Miscellaneous) for Canada. The factor for our Indiana location is approximately 1.07 lb. CO2/kWh and for our Canada location is approximately 0.55 lb. CO2/ kWh. These figures were last updated by EPA in January 2022 (file with most recent U.S. grid factors for CO2 and other derivate emissions can be found at https://www.epa.gov/climateleadership/simplified-ghg-emissions-calculator.)

Water Management

Fresh water provides critical support for our farming operations. Access to the required quantity and quality of water is essential for protecting our salmon and ensuring they thrive from hatch to harvest. We draw all the water supply for our farms from aquifers, via the underground wells located at or in the immediate proximity of our Indiana and Prince Edward Island facilities. We understand that our business is water-intensive and that we share this resource with other members of surrounding communities – other corporate businesses, other farming operations, and residents. Access to required levels of clean water is also critical for these stakeholders. Ensuring ample supply and quality of fresh water in order to comfortably operate our business without disadvantaging local communities is one of the most important factors we use in determining locations for our commercial operations. We also locate our operations in regions that are not prone to significant base water stress in order to avoid exacerbating drought and further depleting regional resources.

- We do not have any permit limitations on the amount of water our Indiana and Canada farms withdraw from the aquifers. The majority of our water resources are used in farming operations at our Indiana facilities, where we grow our GE Atlantic salmon from hatch to harvest. We abide by the requirements of the Indiana Department of Environmental Management (IDEM) and National Pollutant Discharge Elimination System (NPDES) to measure water resources leveraged in our operations at the place of the discharge. Water discharged by our Indiana farm during the year is approximately 1,513 thousand cubic meters (m^3), which includes water used in farming (RAS operations and fish production) and also in corporate operations
- Percentage of water withdrawn from High or Extremely High Base Water Stress (HEHBWS): 0.0%
- Percentage of water consumed from High or Extremely High Base Water Stress (HEHBWS): 0.0%

Waste Management

Our facilities feature Recirculating Aquaculture System ("RAS") technology, which utilizes fresh, clean water to grow our salmon from hatch to harvest. Water in the system is continuously recirculated and filtered, at a rate of 95.5% per hour, meaning that less than 5% of each cycle is safely discharged back to the environment. The RAS system features biological filters to remove waste and return fresh water to maintain an optimal growing environment for our salmon. The resulting wastewater is cleaned before being

moved to settling ponds. Solid waste is separated and removed from the system through the filtering process, and often recycled as fertilizer for local agricultural farmers.

Social Impact

Consumer Welfare: Antibiotic Use in Animal Production

Unlike wild caught or offshore sea-cage farmed salmon, our fish live in indoor tanks, which are designed to prevent them from escaping and reduce the risk of disease and contaminants. This allows the fish to be raised without the use of antibiotics and chemicals frequently used in sea-cage operations. We have developed and implemented Standard Operating Procedures ("SOPs") that govern the physical containment and every significant fish husbandry activity on our farms.

The scope of our antibiotic administration includes animals, including Broodstock, across all of our operations and facilities: 0% of our animals received important antibiotics; 0% of our animals received non-important antibiotics.

Human Capital Management

Recruiting, developing, engaging, and protecting our workforce is critical to executing our strategy and achieving business success. The efficient production of high-quality products and successful execution of our strategy requires a talented, skilled, and engaged team of employees. We work to equip our employees with critical skills and expand their contributions over time by providing a range of training and career development opportunities, including hands-on experiences via challenging work assignments and job rotations, coaching and mentoring opportunities, and training programs. To foster employee engagement and commitment, we follow a robust process to listen to employees, take action, and measure our progress with on-going employee conversations, transparent communications, and employee engagement surveys.

Employee Health, Safety and Advancement

We are committed to maintaining a safe and secure workplace for our employees. We set specific safety standards to identify and manage critical risks. We use global safety management systems and employee training to ensure consistent implementation of safety protocols and accurate measurement and tracking of incidents. To provide a safe and secure working environment for our employees, we prohibit workplace discrimination, and we do not tolerate abusive conduct or harassment. Our attention to the health and safety of our workforce extends to the workers and communities in our supply chain. We believe that respect for human rights is fundamental to our strategy and to our commitment to ethical business conduct.

Governance and Business Ethics

Governance

Our ESG strategy, risk management and reporting is overseen by an internal working committee and external experts. The Committee is chaired by our Chief Commercial Officer and includes all members of our Executive Leadership Team, including our: President & CEO; Chief Scientific Officer; Chief Operating Officer; General Counsel; Chief People Officer; Vice President Facilities & Continuous Improvement; and Chief Financial Officer. Our Board of Directors have oversight over our ESG Committee and initiatives.

Diversity and Inclusion

We are making gender, cultural, and racial diversity one of our key priorities for the next 10 years as we grow to become a major player in sustainable seafood production. Starting in 2019, we added the subject of Board Diversity to our corporate agenda. We currently have eight Board members representing different races and ethnicity, and of the eight Board members, four are women. We are focused on adding diverse, creative, talented, and seasoned personnel to our mid and upper management, as well as young, driven, collaborative and environmentally responsible team members to our entry-level positions. As of December 31, 2022, 37% of our team members identified themselves as women and 63% as men.

Ethical Innovation in Our Supply Chain

To ensure we receive the best equipment, feed, and other key inputs into our production process, our global supplier and vendor network spans across many states in the U.S. and several countries, such as Chile, Norway, Brazil, and Canada. The main suppliers that directly support our production and distribution include RAS equipment vendors, suppliers of parts and maintenance services, ice and oxygen suppliers, refrigeration equipment vendors, feed suppliers, packaging and logistics services and fish processing facilities.

In selecting suppliers, we perform due diligence including review of sustainability and environmental impact information. Especially important is the review of the nutritional composition of feed from a vendor.

One of the advantages of our land-based farms is that we can locate them close to market consumption, which minimizes transportation costs and therefore, our carbon footprint. This allows us to minimize our transportation requirement to fulfill local and regional distribution. In contrast, salmon imported into the U.S. (i.e., from the largest exporter – Chile) requires well boat transportation to and from the coastal farm, motor transportation from the dock/processing facility to an international airport, airfreight (primarily from Norway or Chile) to a major U.S. international airport, a transportation into the interior of the U.S. by motor transport or airfreight and finally, local and regional distribution transportation.

Animal Welfare

We raise salmon in natural, safe, and humane ways at every stage of life, from egg to harvest. We utilize technology and skilled human oversight to continually monitor and manage water quality and fish health. Our focus and targets are based on veterinary expertise and counsel; Industry standards; and customer expectations for quality. We use industry-leading technology to help ensure fish are harvested humanely and with the least possible stress.

- Animal Care and Welfare

  We constantly monitor welfare conditions, such as: Crowding; Fish Transfer, Stunning and Bleeding; Harvesting; Grading; and Usage of Emerging Technologies.

  As part of our welfare indicators, we are monitoring: Skin and Fin Conditions; Scale Losses; Mortality Rate; Reflex Behavior; Appetite – Hunger – Satiation; Gill Bleaching; Sex Maturation; Eye Damage and Cataracts; and Jaw Opercula and Spinal Deformities.

- Animal & Feed Sourcing

  We do not source animals. We are a 100% vertically integrated entity, with our own Broodstock and egg production that are used in our farms from hatch to harvest.

  At this time, we are not growing our own feed stock or manufacturing feed for our GE salmon. We purchase all of our feed for the Indiana and Canada operations from third parties. We routinely conduct analysis of global salmon feed suppliers, focusing on their sustainability practices, components of the feed that contains wild-caught fish, as well as non-marine ingredients.

  Feed is a critical input to growing healthy salmon. We evaluate suppliers that have high product safety and ethical standards, consistent with what we set for ourselves. For the year ending December 31, 2022, we partnered with a sole feed supplier who is a global leader in fish feed supplies that supports the entire spectrum of our fish growth – from fry to harvest size fish. All of the feed we source from this supplier to raise our salmon is either BAP or GlobalGAP certified. These globally recognized non-governmental organizations, which follow their respective internal standards, award their independent third-party certifications to aquaculture sector members that have been deemed by these organizations or their authorized representatives, to produce safe, responsibly and ethically farmed seafood.

  By partnering with this supplier, we help ensure that our salmon are being raised on high quality feed that will eventually carry a high nutritional value to the table of an end-consumer. Also, due to their sustainability profile that covers responsible sourcing and climate change, we have reasonable comfort knowing that by consuming this feed, our salmon are not harming our forests and our oceans, all while creating jobs and supporting small fisheries around the world.

Communities

We believe in the rejuvenation of rural America and other local communities and strive to utilize local businesses when possible. Only when economically viable local options of similar quality are not reasonably available do we move to non-local vendors for the sourcing of equipment, feed, and other inputs. At our Indiana farm, we purchase oxygen and ice from local vendors and utilize local service providers. Whenever feasible, we contract with local small and medium family businesses to help build up communities and local economies.

We also strive to create jobs in local communities that rely on farming operations and communities relying on economic development. We strive to build an experienced, well-compensated and diverse work force. We provide training and learning opportunities to our teams, so they have the required skills and tools to continually improve and make a positive impact on our business.

United Nations Sustainable Development Goals

Our corporate Purpose and operations are aligned with a number of the UN's goals. We are committed to end hunger, achieve food security and improve nutrition, while also promoting sustainable land-based aquaculture to provide a resilient and domestic supply of fresh salmon. We continually transform the aquaculture segment through our research, innovation and genetics-based technology. Our management makes conscious decisions to locate our farms close to key consumption markets, providing greater access to all consumers including underserved communities. We work hard to supply populations with high-quality, healthy, affordable and nutritious salmon that is cultivated with the well-being of the planet in mind and provides a much needed relief for our oceans and rivers. Our plans are to bring our technology and expertise to other countries, including developing regions.

Item 1A. Risk Factors

The following are certain risk factors that could affect our business, financial condition, and results of operations. You should carefully consider the risks described below, together with the other information contained in this Annual Report on Form 10-K, including our consolidated financial statements and the related notes. We cannot assure you that any of the events discussed in the risk factors below will not occur. These risks could have a material and adverse impact on our business, results of operations, financial condition, or prospects. If that were to happen, the trading price of our common stock could decline, and you could lose all or part of your investment.

This Annual Report on Form 10-K also contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including the risks faced by us described below and elsewhere in this Annual Report on Form 10-K. See "Cautionary Note Regarding Forward-Looking Statements" for information relating to these forward-looking statements.

Risks Relating to our Business and Operations

We have a history of net losses and will likely incur future losses and may not achieve or maintain profitability.

In the period from incorporation to December 31, 2022, we have incurred cumulative net losses of approximately $193 million. These losses reflect our personnel, research and development, production and marketing costs. We expect revenues to grow modestly in 2023, however, our ability to realize revenues and the timing thereof are not certain, and achieving revenues does not assure that we will become profitable.

Our business plans include the need for substantial additional capital and without it we may not be able to implement our strategy as planned or at all.

Our strategy depends on our ability to develop and construct additional farms, including our planned Ohio farm. We have begun construction of this farm and its construction, and others in the future, is contingent on a number of significant uncertainties, including those described below. As a result, we may be unable to construct such facilities as planned or at all. We may not be able to obtain the financing necessary to complete construction of our proposed facilities. We estimate that the total project cost for the Ohio farm, including construction, land, insurance and ancillary costs will range between $375 million and $395 million, although this figure is likely to continue to change as we finalize the design, finalize bids from contractors and continue with construction. For example, at least partially due to recent inflationary pressures, subcontractors for certain goods and services at our Ohio farm have submitted bids above the levels that we expected. As a result of these increases, and increased interest rates, we have raised our estimate for the total cost for the project and we increased the amount of proposed debt financing. However, there can be no guarantee that our attempts will be successful, and macro-economic conditions could worsen, which could result in further cost increases and further financing and construction-related delays.

We do not have the financial resources required to fully finance the construction of the Ohio farm. We will seek to raise part of these necessary funds through debt financing. Recent increases to interest rates have increased the borrowing costs for this financing, and any further increases before the financing is complete could further increase such costs. Volatility and/or declines in equity markets in general, and for our securities, may cause equity financing to be unavailable on acceptable terms or at all. We may also need further funding if there are delays in construction or increased construction costs at our construction site in Ohio. We may finance unanticipated construction costs by issuing equity securities or debt. The delay or failure of regulatory bodies to approve our construction plans, disruption and volatility in the financial markets, tighter credit markets and a downturn in the seafood market may negatively impact our ability to obtain financing. We may not have access to the required funding, or funding may not be available to us on acceptable terms.

We may not be able to obtain the approvals and permits that will be necessary in order to construct our facilities as planned. We will need to obtain a number of required permits in connection with the hydrology, construction and operation of our farms, which is often a time-consuming process. We will also need to obtain FDA approval to grow our GE Atlantic salmon in the facility. If we experience delays in obtaining the required approvals and permits for our farms, our expected construction completion date, commercial stocking and first sale of our GE Atlantic salmon may be delayed. If we are unable to obtain the required approvals and permits for our farms, we will not be able to construct the farms. In addition, federal, state and local governmental requirements could substantially increase our costs, which could materially harm our results of operations and financial condition.

We have encountered cost increases in the expected construction cost of the Ohio farm, and may encounter further unanticipated difficulties and cost overruns in constructing this farm and other future farms. Preparing cost and timing estimates for complex RAS farms is inherently difficult and subject to change based on a number of factors that we have experienced to date and may

experience in the future, including design changes, increasing inflationary pressure on costs of materials and labor, the impact of health epidemics such as COVID-19, construction delays, dependence on contractors, the impact of increasing interest rates on financing costs, customer requirements and unexpected complications. As a result, we may encounter unanticipated difficulties and the construction and development of our proposed farms may be more costly or time-consuming than we anticipate.

Delays and defects may cause our costs to increase to a level that would make one or more of our farms too expensive to construct or unprofitable. We may suffer significant delays or cost overruns at our farms that could prevent us from commencing operations as expected as a result of various factors. These factors include shortages of workers or materials, construction and equipment cost escalation, transportation constraints, adverse weather, unforeseen difficulties or labor issues, or changes in political administrations at the federal, state or local levels that result in policy change towards genetically engineered foods in general or our products and farms in particular. Defects in materials or workmanship could also delay the commencement of operations of our planned farms, increase production costs or negatively affect the quality of our products. Due to these or other unforeseen factors, we may not be able to proceed with the construction or operation of our farms in a timely manner or at all.

Recent increases in interest rates have increased our expected borrowing costs for the construction of our planned farm in Pioneer, Ohio, and may also affect our ability to obtain working capital through borrowings such as bank credit lines and public or private sales of debt securities, which may result in lower liquidity, increased expense and difficulty in financing our expansion plans, reduced working capital and other adverse impacts on our business.

All of our currently outstanding interest-bearing debt is financed at fixed rates, except for our loan with First Farmers Bank and Trust, which has a rate reset in July 2025. We will seek to raise part of the funds necessary for construction of our planned farm in Pioneer, Ohio, and other future farms, through debt financing. Continued increases in interest rates has already, and will further increase the cost of new indebtedness and, after the rate reset, servicing our outstanding indebtedness with First Farmers Bank and Trust, and could materially and adversely affect our expansion plans, results of operations, financial condition, liquidity and cash flows.

Rising inflation rates could negatively impact our revenues and profitability if increases in the prices of our products or a decrease in consumer spending results in lower sales. In addition, if our costs increase and we are not able to pass along these price increases to our customers, our net income would be adversely affected, and the adverse impact may be material.

Inflation rates, particularly in the United States, have increased recently to levels not seen in years. Increased inflation has and may continue to result in increased construction costs for new farms, increased operating costs (including our labor costs), reduced liquidity, and limitations on our ability to access credit or otherwise raise debt and equity capital. In addition, the United States Federal Reserve has raised, and may again raise, interest rates in response to concerns about inflation. Increases in interest rates, especially if coupled with reduced government spending and volatility in financial markets, may have the effect of further increasing economic uncertainty and heightening these risks. In an inflationary environment, we may be unable to raise the sales prices of our products and services at or above the rate at which our costs increase, which would reduce our profit margins and have a material adverse effect on our financial results. We also may experience lower than expected sales and potential adverse impacts on our competitive position if there is a decrease in consumer spending. A reduction in our revenue would be detrimental to our financial condition and could also have an adverse impact on our future growth.

The financing of our Ohio farm through the placement of municipal bonds may require restrictive debt covenants that could limit our control over the farm's operation and restrict our ability to utilize a portion of any cash that the farm generates.

We anticipate using both cash on hand and debt to finance the construction and initial working capital for our Ohio farm. Debt financing will likely contain certain customary restrictive covenants that require us to maintain certain operating ratios and may restrict our use of any cash that is generated by the farm. The amount of debt used to finance the project may be significant and may require the use of a trustee to oversee the project funds and to monitor the project's performance and adherence to any restrictive covenants. Failure to meet the restrictive covenants over a period of time could result in more oversight by the trustee and a loss of some of our control over the operation, or in the extreme by the trustee stepping in to manage the farm's operation.

Our term loan agreement with First Farmers Bank and Trust in the amount of $4 million contains certain customary restrictive covenants that limit our ability, including without limitation, to incur additional indebtedness and liens, merge with other companies or consummate certain changes of control, acquire other companies, engage in new lines of business and make certain investments, as well as financial covenants requiring us to maintain certain ratios with respect to our operations. Our ability to comply with these covenants may be affected by events beyond our control, and we may not be able to meet those covenants. A breach of any of these covenants could result in a default under the term loan agreement, which could cause all of the outstanding indebtedness under our

term loan to become immediately due and payable. In that event, we would be required to disclose the default in our public filings, which could have an adverse effect on the price of our shares of common stock. These covenants could also limit our ability to seek capital through the incurrence of new indebtedness or, if we are unable to meet our obligations, require us to repay any outstanding amounts with sources of capital we may otherwise use to fund our business, operations and strategy.

Ethical, legal, and social concerns about genetically engineered products could limit or prevent the use of our products and limit our revenues.

Our technologies include the use of genetic engineering. Public perception about the safety and environmental hazards of, and ethical concerns over, genetically engineered products could influence public acceptance of our technologies and products. Activist groups opposing the genetic engineering of organisms have in the past pressured a number of retail food outlets and grocery chains to publicly state that they will not carry genetically engineered Atlantic salmon, and they could file lawsuits to prevent the production and sale of our products. If we are not able to overcome the ethical, legal, and social concerns relating to genetic engineering, products using our technologies may not be accepted in the marketplace, and demand for our products could fall short of what we expect. These concerns could also result in increased expenses, regulatory scrutiny, delays, or other impediments to implementation of our business plan.

The subject of genetically engineered products has received negative publicity, which has aroused public debate. This adverse publicity could lead to lawsuits against the production, distribution, and sale of genetically engineered products; greater regulation of those products; and trade restrictions on their importation. Further, there is a concern that products produced using our technologies could be perceived to cause adverse events, which could also lead to negative publicity.

We may have limited success in gaining consumer acceptance of our products.

There is an active and vocal group of opponents to genetically engineered products who wish to ban or restrict the technology and who, at a minimum, hope to sway consumer perceptions and acceptance of this technology. Their efforts include regulatory legal challenges and labeling campaigns for genetically engineered products, as well as application of pressure to multiple channels of distribution including, but not limited to distributors, food service operators, and consumer retail outlets seeking a commitment not to carry genetically engineered Atlantic salmon. We may not be able to overcome the negative consumer perceptions that these organizations have instilled against our products.

Our business is affected by the quality and quantity of the salmon that we harvest.

We sell our products in a highly competitive market. Our ability to successfully sell our products, and the price that we receive, is highly dependent on the quality of the salmon that we produce. A number of factors can negatively affect the quality of the salmon that we sell, including the quality of our broodstock, water conditions in our farms, the food and additives consumed by our fish, population levels in the tanks, and the amount of time that it takes to bring a fish to harvest, including transportation and processing. We have experience operating RAS facilities and raising salmon, and while we actively monitor these factors using rigorous standard operating procedures, we cannot always ensure optimal growing conditions. Although fish grown in RAS production systems are not subject to the disease and parasite issues that can affect salmon grown in ocean pens, there is the potential for organisms that are ubiquitous to freshwater environments to become pathogenic if the fish are subjected to stressful conditions or there is an issue with biomass management.

We maintain high standards for the quality of our product and if we determine that a harvest has not met such standards, we may be required to reduce our inventory and write down the value of the harvest to reflect net realizable value. Sub-optimal conditions could lead to smaller harvests and or lower quality fish. Conversely, if we experience better than expected growth rates, we may not be able to process and bring our fish to market in a timely manner, which may result in overcrowding that can cause negative health impacts and/or require culling our fish population.

Further, if our salmon is perceived by the market to be of lower quality than other available sources of salmon or other fish, we may experience reduced demand for our product and may not be able to sell our products at the prices that we expect or at all. For example, we concluded 2020 with a conventional Atlantic salmon harvest that met our high standards for nutrition, taste and texture. However, unlike our GE Atlantic salmon, the conventional salmon did not achieve the same high level of color consistency, due in part to the maturity of the male population and the quality of the ingredients in the feed. We identified and successfully addressed the source of the color inconsistency in the conventional salmon, and our production plans call for only raising our all-female GE Atlantic salmon moving forward. As we continue to expand our operations and build new farms, we potentially may face additional challenges with maintaining the quality of our products. We cannot guarantee that we will not face quality issues in the future, any of which could cause damage to our reputation, and a loss of consumer confidence in our products, which could have a material adverse effect on our business results and the value of our brands.

In addition, we may be required to recall some of our products if they spoil, become contaminated, are tampered with or are mislabeled. A widespread product recall could result in significant losses due to the costs of a recall, the destruction of product inventory and lost sales due to the unavailability of product for a period of time. Such a product recall also could result in adverse publicity, damage to our reputation, and a loss of consumer or customer confidence in our products, which could have a material adverse effect on our business results and the value of our brands.

We may experience a significant fish mortality event in our broodstock or our production facilities that could impact the price of our common stock.

In recent periods, other companies in the land-based aquaculture industry have experienced fish mortality events that resulted in a decline in their share price. It is possible that our operations could experience a significant fish mortality event due to, among other causes, disease, pathogens, human error, intentional malfeasance, a weather event, loss of access to electricity or water, or damage to our farms, or other factors beyond our control. If we were to have a significant fish mortality event, this could lead to a reduction in production harvests, loss of broodstock, loss of revenue, increased production costs, and public relations damage, the result of which could impact the price of our common stock.

A shutdown, material damage to any of our farms, or lack of availability of power, fuel, oxygen, eggs, water, or other key components needed for our operations, could result in our prematurely harvesting fish, a loss of a material percentage of our fish in production, a delay in our commercialization plans, and a material adverse effect on our operations, business results, reputation, and the value of our brands.

At present, we have farms in Albany, Indiana, and Prince Edward Island, Canada. As an interruption in the power, fuel, oxygen supply, water quality systems, or other critical infrastructure of an aquaculture facility for more than a short period of time can lead to the loss of a large number of fish, any shutdown of or damage to either of our farms—for example, due to weather or other natural disaster, shortages of key components to our operations due to a pandemic, reduction in water supply, contamination of our aquifers, interruption in services beyond our backup capacity, or human interference—could require us to prematurely harvest some or all of the fish at that farm or could result in a loss of a material percentage of our fish in production. In addition, any transportation-related or other accidents that may result in a spill of hazardous materials near our farms, which may contaminate the land and/or groundwater, may result in a loss of a material percentage of our fish and other material adverse effects on our operations.

We also are dependent on egg availability and being able to ship genetically engineered Atlantic salmon eggs from Canada to the United States for production. If we had a disruption in our ability to produce our eggs in Canada or ship our eggs to the United States, due to border closings or some other event that would prevent us from importing the eggs to the United States, we would not be able to continue to stock our Indiana Farm with genetically engineered Atlantic salmon eggs. We cannot guarantee that any of these disruptions might not occur in the future, any of which could cause loss of salmon to sell, damage to our reputation, loss of consumer confidence in our products and company, and lost revenues, all of which could have a material adverse effect on our business results and the value of our brands.

Security breaches, cyber-attacks and other disruptions could compromise our information, expose us to fraud or liability, or interrupt our operations, which would cause our business and reputation to suffer.

In the ordinary course of our business, we use our servers and networks to store sensitive data, including our proprietary business and financial information; general business information regarding our customers, suppliers, and business partners; and personally identifiable information of our employees; and to operate our farm equipment. The security of our network and the storage and maintenance of sensitive information is critical to our operations. Despite our security measures, our information technology and infrastructure may be vulnerable to cyber-attacks by hackers or breached due to employee error or malfeasance. A breach of our security could compromise our networks and the information stored on our servers could be accessed, manipulated, publicly disclosed, lost, or stolen. Any such access, manipulation, disclosure, or loss of information could result in errors in our records, fraudulent use of our financial information or theft of assets, legal claims or proceedings, liability under laws that protect the privacy of personal information, theft of our intellectual property, or damage to our reputation. In addition, our systems could be the subject of denial of service or other interference, which could disrupt our operations and commercial transactions.

In addition, with the continued automation of our farm operations, there is the possibility of exposure to critical assets or sensitive information loss stemming from a cyber-attack on communication interfaces with outside vendors, which could adversely impact our farm operations. Any of the foregoing could adversely affect our business, revenues, and competitive position.

The successful development of our business depends on our ability to efficiently and cost-effectively produce and sell salmon at large commercial scale.

Although we have over two decades of experience in successfully raising Atlantic salmon in land-based systems, we have only begun to produce them at commercial scale. Our business plans depend on our ability to increase our production capacity through the development of larger farms. We have limited experience constructing, ramping up, and managing such large, commercial-scale facilities, and we may not have anticipated all of the factors or costs that could affect our production, harvest, sale, and delivery of salmon at such a scale. For example, our salmon may not perform as expected when raised at very large commercial scale, we may encounter operational challenges for which we are unable to identify a workable solution, control deficiencies may surface, our vendors may experience capacity constraints, or our production cost and timeline projections may prove to be inaccurate. Any of these could decrease process efficiency, create delays, and increase our costs. We are also subject to volatility in market demand and prices, such as the disruption to the salmon market and the resulting reduction in market prices for salmon that occurred during the COVID-19 pandemic.

In addition, competitive pressures, customer volatility and the possible inability to secure established and ongoing customer partnerships and contracts, may result in a lack of buyers for our fish. Customers of our fish may not wish to follow our terms and conditions of sale, potentially resulting in a violation of labeling or disclosure laws, improper food handling, nonpayment for product, and similar issues. The competitive landscape for salmon may create challenges in securing competitive pricing for our salmon to reach our competitive goals. In addition, it is possible that we may not be able to service our customers to meet their expectations regarding fish quality, ongoing harvest supply availability, order processing fill rate, on time or correct deliveries, potential issues with third party processors, and other factors, which could impact our relationships with customers, our reputation, and our business results.

We remain dependent on third parties for the processing, distribution, and sale of our products.

At present, we rely on third parties to process our fish, deliver them to seafood vendors, and ultimately sell them to consumers. While we carefully select processors or other intermediaries in the supply chain, any failure on their part to maintain quality standards or proper food handling processes could subject us to product liability claims, product recalls, increased scrutiny from regulators, and loss of consumer confidence in the safety and quality of our products. Seafood vendors may reject our products due to their particular product or volume requirements, extract pricing concessions that reduce our margins, or fail to adequately promote and sell our products. Our reliance on third parties could therefore result in a reduction in our revenues, an increase in our costs, delays in commercialization, additional regulatory requirements, or negative public opinion that could impact future sales and growth.

We may be required to write-down the value of our inventory if its net realizable value is less than its accumulated cost at the end of a reporting period.

Our fish-in-process inventory is a biological asset and is stated on our balance sheet at the lower of cost or net realizable value, where net realizable value is calculated as the estimated market price less the estimated costs of processing, packaging and transportation. Any adjustments to the carrying value of inventory are reported as a component of production costs on our income statement. Such adjustments may be material in any given period and could adversely affect our financial condition and results of operations. Until such time as our net realizable value is consistently in excess of inventory costs, our inventory may be subject to significant market value risk. For example, during the third quarter of 2021, we recognized a $1.5 million charge to reduce the value of our inventory to its net realizable value, based on our production yields and transportation costs which were higher than our expectations.

If our products become contaminated, we may be subject to product liability claims and product recalls, which could adversely affect our financial results and damage our reputation.

Food safety issues (both actual and perceived) may have a negative impact on, the reputation of and demand for, our products. In addition to the need to comply with relevant food safety regulations, it is of critical importance that our products are safe and perceived as safe and healthy in all relevant markets.

Our products may be subject to contamination by foreign materials or disease-producing organisms or pathogens, such as Listeria monocytogenes, Salmonella and E. coli. These organisms and pathogens are found generally in the environment and there is a risk that one or more, as a result of food processing, could be present in our products. These organisms and pathogens also can be introduced to our products as a result of improper handling at the further-processing, foodservice or consumer level. These risks may be controlled, but may not be eliminated, by adherence to good manufacturing practices and finished product testing. We have little, if any, control over handling procedures once our products have been shipped for distribution. Even an inadvertent shipment of contaminated products may be a violation of law and may lead to increased risk of exposure to product liability claims, increased scrutiny and penalties, including but not limited to, injunctive relief and plant closings, by federal and state regulatory agencies, and adverse

publicity, which could exacerbate the associated negative consumer reaction. Any of these occurrences may have an adverse effect on our financial results and the value of our brands.

In addition, we may be required to recall some of our products if they spoil, become contaminated, are tampered with or are mislabeled. A widespread product recall could result in significant losses due to the costs of a recall, the destruction of product inventory and lost sales due to the unavailability of product for a period of time. Such a product recall also could result in adverse publicity, damage to our reputation, and a loss of consumer confidence in our products, which could have a material adverse effect on our business results and the value of our brands.

The loss of our GE Atlantic salmon broodstock could result in the loss of our commercial technology.

Our GE Atlantic salmon, or more specifically the breeding population of live fish, or broodstock, themselves, is a product of our combined intellectual property, which includes our trade secrets related to creating and maintaining the broodstock. Destruction of our salmon broodstock by whatever means would result in a significant delay to our operations while the broodstock was replenished. Live animals are subject to disease that may, in some cases, prevent or cause delay in the export of eggs to our farms. Disease organisms may be present undetected and transferred inadvertently. In addition, our broodstock is kept at a limited number of facilities, and damage to or failure of critical systems at any one of those facilities could lead to the loss of a substantial percentage of our broodstock. Such events may cause loss of revenue, increased costs, or both. The broodstock, however, could be reinstated, in whole or in part, using our technology and stored breeding reserves.

Business, political, or economic disruptions or global health concerns, such as the COVID-19 pandemic, could seriously harm our current or planned business and increase our costs and expenses.

Broad-based business or economic disruptions, political instability, or global health concerns could adversely affect our current or planned production, sale, distribution, research and development, and expansion. For example, the COVID-19 pandemic and its related adverse public health developments, including orders to shelter-in-place, travel restrictions, and mandated business closures adversely affected workforces, organizations, customers, economies, and financial markets globally, leading to an economic downturn and increased market volatility. It also disrupted the normal operations of many businesses, including ours.

Global health concerns like the COVID-19 pandemic could in themselves result in social, economic, and labor instability in the countries in which we or the third parties with whom we engage operate. The COVID-19 pandemic and government measures taken in response had a significant impact, both direct and indirect, on businesses and commerce, as worker shortages occurred. These impacts included the shortage of packaging workers and transportation suppliers that we experienced, leading to slower and more expensive harvests and increased culling activity; supply chain disruptions; facility and production suspensions; and demand for certain goods and services, such as medical services and supplies spiked, while demand for other goods and services, including salmon in the institutional sales chain that includes restaurants fell, with a resulting drop in the prices for those goods and services. We were impacted by the reduction in food service demand for salmon due to the pandemic in the form of significantly lower than expected sales and a reduction in the value of our inventory.

We cannot predict the scope and severity of business, political or economic disruptions or global health concerns. If we or any of the third parties with whom we engage, including suppliers, distributors, service providers, regulators, and overseas business partners, experience shutdowns or other disruptions again in the future, our ability to conduct our business in the manner and on the timelines presently planned could be materially and negatively impacted, our anticipated revenues could decrease, and our costs and expenses could continue to rise as a result of our efforts to address such disruptions.

Industry volatility can affect our earnings, especially due to fluctuations in commodity prices of salmon.

Profitability in the salmon industry is materially affected by the commodity price of salmon, and to a lesser extent, alternative proteins. These prices are determined by supply and demand factors and can fluctuate by season. For example, the COVID-19 pandemic impacted market demand for salmon, which resulted in market prices falling by up to 40% for certain product presentations. Conversely, given the long grow-out cycle for raising salmon, disruptions in production can depress market supply and result in price increases.

If we lose key personnel, including key management personnel, or are unable to attract and retain additional personnel, it could delay our commercialization plans or harm our research and development efforts, and we may be unable to sell or develop our own products.

Our success depends substantially on the efforts and abilities or our officers and other key employees. The loss of any key members of our management, or the failure to attract or retain other key employees who possess the requisite expertise for the conduct of our

business, could prevent us from developing and commercializing our products and executing on our business strategy. We may not be able to attract or retain qualified employees in the future due to the intense competition for qualified personnel among aquaculture, biotechnology, and other technology-based businesses, or due to the unavailability of personnel with the particular qualifications or experience necessary for our business. For production positions, effective training will be needed for new hires due to the overall lack of industry experience in land-based aquaculture in North America. If we are not able to attract, train, and retain the necessary personnel to accomplish our business objectives, we may experience staffing constraints that could adversely affect our ability to meet the demands of our customers in a timely fashion, adequately staff existing or new production facilities, or support our internal research and development programs. In particular, our production facilities require individuals experienced or trained in RAS-based aquaculture, and our product development programs are dependent on our ability to attract and retain highly skilled scientists. Competition for experienced production staff, scientists, and other technical personnel from numerous companies and academic and other research institutions may limit our ability to attract and retain such personnel on acceptable terms.

Atlantic salmon farming is restricted in certain states.

Concerns regarding the possible environmental impact from our GE Atlantic salmon have led some states to impose legislative and regulatory restrictions or bans on its farming. In addition, some states, such as Alaska, have enacted restrictions on Atlantic salmon farming generally. While we currently believe that many states offer excellent potential sites for our salmon production farms, if additional states adopt similar restrictions, or otherwise prohibit the rearing of our GE Atlantic salmon in those states, the number of potential sites available to us for production farms in the United States could be reduced.

Atlantic salmon farming is subject to disease outbreaks, which can increase the cost of production and/or reduce production harvests.

Salmon farming systems, particularly conventional, open sea-cage systems, are vulnerable to disease introduction and transmission, primarily from the marine environment or adjacent culture systems. The economic impact of disease to these production systems can be significant, as farmers must incur the cost of preventative measures, such as vaccines and antibiotics, and then, if the fish become infected, the cost of lost or reduced harvests.

Although we produce and grow our GE Atlantic salmon in land-based, closed containment facilities, we are still at risk for potential disease outbreaks. We have implemented biosecurity measures in our facilities intended to prevent or mitigate disease impact, but there can be no assurance that any measures will be 100% effective.

We may encounter difficulties managing our growth, which could adversely affect our business.

We could face a period of rapid growth following expansion of our production capability, which may place significant pressure on our management, sales, operational, and financial resources. The execution of our business plan and our future success will depend, in part, on our ability to manage current and planned expansion and on our ability to continue to implement and improve our operational management. Any failure to manage the planned growth may have a significant adverse effect on our business, financial condition, trading performance, and prospects.

We may pursue strategic acquisitions and investments that could have an adverse impact on our business if they are unsuccessful.

If appropriate opportunities become available, we may acquire businesses, assets, technologies, or products to enhance our business in the future. In connection with any future acquisitions, we could:

- issue additional equity securities, which would dilute our current shareholders;
- incur substantial debt to fund the acquisitions; or
- assume significant liabilities.

Acquisitions involve numerous risks, including:

- difficulties integrating the purchased operations, technologies, or products;
- unanticipated costs and other liabilities;
- diversion of management's attention from our core business;
- adverse effects on existing business relationships with current and/or prospective customers and/or suppliers;
- risks associated with entering markets in which we have no or limited prior experience; and
- potential loss of key employees.

We do not have extensive experience in managing the integration process, and we may not be able to successfully integrate any businesses, assets, products, technologies, or personnel that we might acquire in the future without a significant expenditure of operating, financial, and management resources. The integration process could divert management time from focusing on operating our business, result in a decline in employee morale, or cause retention issues to arise from changes in compensation, reporting relationships, future prospects, or the direction of the business. Acquisitions also may require us to record goodwill and non-amortizable intangible assets that will be subject to impairment testing on a regular basis and potential periodic impairment charges, incur amortization expenses related to certain intangible assets, and incur large and immediate write-offs and restructuring and other related expenses, all of which could harm our operating results and financial condition. In addition, we may acquire companies that have insufficient internal financial controls, which could impair our ability to integrate the acquired company and adversely impact our financial reporting. If we fail in our integration efforts with respect to any of our acquisitions and are unable to efficiently operate as a combined organization, our business and financial condition may be adversely affected.

We have entered into agreements that require us to pay a significant portion of our future revenue to third parties.

In 2009, we received a grant from the Atlantic Canada Opportunities Agency to fund a research program. A total of C$2.9 million was made available under the grant, and we received the entire amount through December 31, 2015. If we begin to generate revenue from any of the products from the research program, we must commence repayment of the outstanding loan in the form of a 10% royalty. These payments could negatively impact our ability to support our operations. Revenues from sales of our GE Atlantic salmon are not subject to the royalty.

Our financial condition or results of operations may be adversely affected by international business risks, including exchange rate fluctuation.

The majority of our employees, including our research personnel, are currently located outside of the United States. As a consequence of the international nature of our business, we are exposed to risks associated with international operations. For example, we are based in the United States and present our financial statements in U.S. dollars, and the majority of our cash resources are held in U.S. dollars or in Canadian dollars. Some of our future expenses and revenues are expected to be denominated in currencies other than in U.S. dollars. Other risks include possible governmental restrictions of the movement of funds, limitation of contractual rights, or expropriation of assets without fair compensation. Therefore, movements in exchange rates to translate to foreign currencies and other international operational risks may have a negative impact on our reported results of operations, financial position, and cash flows.

We have received government research grants and loans in the past, but such grants and loans may not be available in the future.

We have in the past received government assistance in the form of research grants and loans to partially fund various research projects, including projects involving our GE Atlantic salmon. There can be no assurance that additional government assistance will be available in the future to help offset the cost of our research activities, in which case we would need to fund our research projects entirely from our available cash resources, which may be limited. This could delay progress on future product development and introduction. In addition, we may be subject to audit by the government agencies that provided research assistance to ensure that the funds were used in accordance with the terms of the grant or loan. Any audit of the use of these funds would require the expenditure of funds and result in the diversion of management's attention.

Our ability to use net operating losses and other tax attributes to offset future taxable income may be subject to certain limitations.

In general, under Sections 382 and 383 of the U.S. Tax Code (the "Code"), a corporation that undergoes an "ownership change" is subject to limitations on its ability to utilize its pre-change net operating losses ("NOLs"), tax credits, or other tax attributes to offset future taxable income or taxes. For these purposes, an ownership change generally occurs where the aggregate stock ownership of one or more stockholders or groups of stockholders who owns at least 5% of a corporation's stock increases its ownership by more than 50 percentage points over its lowest ownership percentage within a specified testing period. In addition to limitations imposed by the 2017 Tax Cuts and Jobs Act, a portion of our NOLs are subject to substantial limitations arising from previous ownership changes, and, if we undergo another ownership change, our ability to utilize NOLs could be further limited by Sections 382 and 383 of the Code. In addition, future changes in our stock ownership, many of which are outside of our control, could result in an ownership change under Sections 382 and 383 of the Code. Our NOLs may also be impaired under state law. Accordingly, we may not be able to utilize a material portion of our NOLs. Furthermore, our ability to utilize our NOLs is conditioned upon our attaining profitability and generating U.S. federal and state taxable income.

Risks Relating to Regulated Products

Our ability to generate revenue to support our operations depends on maintaining regulatory approvals for our GE Atlantic salmon and our farm sites and obtaining new approvals for farm sites and the sale of our products in other markets, the receipt of which is uncertain.

As a genetically engineered animal for human consumption, our GE Atlantic salmon required approval from the FDA in the United States and the Ministers of Health and Environment in Canada before it could be produced, sold, or consumed in those countries. Our FDA approval covers the production of our eggs in our hatchery in Canada and the grow-out of our eggs in our facilities in Indiana and Rollo Bay. FDA approvals will be needed for each additional facility we plan to operate. Additionally, we will require local regulatory approvals in other countries in which we hope to operate. There is no guarantee that we will receive or be able to maintain regulatory approvals from the FDA or other regulatory bodies or that there will not be a significant delay before approval. There is also no guarantee that any approvals granted will not be subject to onerous obligations in relation to matters such as production or labeling, or that any regulator will not require additional data prior to approval, which may be costly and time-consuming to acquire.

The ability of the FDA to review and approve new products can be affected by a variety of factors, including government budget and funding levels and statutory, regulatory, and policy changes. Average review times at the agency have fluctuated in recent years as a result. In addition, government funding of other agencies on which our operations may rely is subject to the political process, which is inherently fluid and unpredictable.

Disruptions at the FDA and other agencies may also slow the time necessary for new applications to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, in May 2021, the FDA released its Resiliency Roadmap for FDA Inspectional Oversight, which described the prioritization process for FDA inspections and oversight. We believe that our GE Atlantic salmon would be treated as a "tier 2 - higher priority" product, but not a "tier 1 - mission critical" product. This designation could potentially impact the ability of the FDA to timely review and process our regulatory submissions, which could have a material adverse effect on our business.

We will be required to continue to comply with FDA and foreign regulations.

Even with the approval of our NADA and other regulatory applications for our GE Atlantic salmon, we must continue to comply with FDA and other regulatory requirements not only for manufacturing, but also for labeling, advertising, record keeping, and reporting to the FDA and other regulators of adverse events and other information. Failure to comply with these requirements could subject us to administrative or judicial enforcement actions, including but not limited to product seizures, injunctions, civil penalties, criminal prosecution, refusals to approve new products, or withdrawal of existing approvals, as well as increased product liability exposure, any of which could have a material adverse effect on our business, financial condition, or results of operations.

The markets in which we intend to sell our products are subject to significant regulations.

In addition to our FDA approval for the sale and consumption of our GE Atlantic salmon in the United States, we are also subject to state and local regulations and permitting requirements, which could impact or delay the commercialization and commencement of revenue generation from the sale of our salmon. International sales also are subject to rules and regulations promulgated by regulatory bodies within foreign jurisdictions. There can be no assurance that foreign, state, or local regulatory bodies will approve the sale and consumption of our product in their jurisdiction.

We may incur significant costs complying with environmental, health, and safety laws and regulations, and failure to comply with these laws and regulations could expose us to significant liabilities.

Our operations are subject to a variety of federal, state, local, and international laws and regulations governing, among other matters, the use, generation, manufacture, transportation, international shipment, storage, handling, disposal of, and human exposure to our products in both the United States and overseas, including regulation by governmental regulatory agencies, such as the FDA and the U.S. Environmental Protection Agency. We have incurred, and will continue to incur, capital and operating expenditures and other costs in the ordinary course of our business in complying with these laws and regulations. Additional laws and regulations could be adopted in the future further regulating our business.

We may become subject to increasing regulation, changes in existing regulations, and review of existing regulatory decisions.

Regulations pertaining to genetically engineered animals are still developing and could change from their present state. In addition, new legislation could require new regulatory frameworks, changes in existing regulation, or re-evaluation of prior regulatory decisions. For example, despite the FDA's final determination that our GE Atlantic salmon may be sold without being labeled as a

genetically engineered product, a provision added to the 2016 Omnibus Appropriations Act required the FDA to issue final guidance for such labeling. The FDA was therefore obligated to maintain an Import Alert starting in January 2016 that prohibited import of our GE Atlantic salmon until such guidance was finalized or the provision was no longer effective. On March 8, 2019, several months after the USDA promulgated its final rule establishing the Disclosure Standard, which included disclosure requirements for bioengineered foods, including our GE Atlantic salmon, the FDA lifted the Import Alert.

Similarly, in July 2017, a bill was introduced in the United States Senate that could have, had it become law, required labeling unique to, as well as re-examination of the environmental assessments used by the FDA in its 2015 approval of the NADA for our GE Atlantic salmon. While this bill was reintroduced in January 2019 without the requirement for re-examination of those environmental assessments, any such legislatively imposed review of a completed regulatory process could result in new restrictions on, or delays in, commercialization of our product in the United States. We could be subject to increasing or more onerous regulatory hurdles as we attempt to commercialize our product, which could require us to incur significant additional capital and operating expenditures and other costs in complying with these laws and regulations. Our regulatory burdens could also increase if our GE Atlantic salmon are found, or believed, to grow to a larger final size than conventional Atlantic salmon.

In addition, the 2020 Appropriations Act, which was signed into law in December 2019, contained an amendment that requires that any bioengineered animal approved by FDA prior to the effective date of the Disclosure Standard shall include the words "genetically engineered" prior to the existing acceptable market name. While the Company believes that this labeling requirement is unnecessary and redundant to the requirement of the Disclosure Standard, it will comply with all applicable laws.

Additional regulatory and lawmaking activity within the United States and abroad could increase our costs and/or delay or prevent the production and sales of our GE Atlantic salmon.

We or regulatory agencies approving of our products may be sued by non-governmental organizations and others who are opposed to the development or commercialization of genetically engineered products.

There are many organizations in the United States and elsewhere that are fundamentally opposed to the development of genetically engineered products. These groups have a history of bringing legal action against companies attempting to bring new biotechnology products to market. On December 23, 2013, an application was filed by two NGOs with the Canadian Federal Court seeking judicial review to declare invalid the decision by the Canadian Minister of the Environment to publish in the Canadian Gazette a Significant New Activity Notice ("SNAN") with respect to our GE Atlantic salmon. Though the Canadian Federal Court dismissed this challenge, the petitioners filed an appeal of the ruling, which was subsequently dismissed by the Canadian Federal Court of Appeal on October 21, 2016.

On March 30, 2016, a coalition of non-governmental organizations filed a complaint in the United States District Court for the Northern District of California against the FDA, the United States Fish and Wildlife Service, and related individuals for their roles in the approval of our GE Atlantic salmon. Subsequently, the Fish and Wildlife Service was dismissed from the case, and AquaBounty joined the case as an intervenor to protect AquaBounty's interests. The coalition, including the Center for Food Safety and Friends of the Earth, claims that the FDA had no statutory authority to regulate genetically engineered animals, and, if it did, that the agency failed to analyze and implement measures to mitigate ecological, environmental, and socioeconomic risks that could impact wild salmon and the environment, including the risk that our GE Atlantic salmon could escape and threaten endangered wild salmon stocks. In December 2019 the court found that FDA had authority/jurisdiction over genetically engineered animals and in November 2020, the judge remanded the Environmental Assessment (the approval) to FDA on National Environmental Protection Act (NEPA) and Endangered Species Act (ESA) grounds. In April 2021, FDA/US Department of Justice filed a notice of appeal relating to several claims in that case, and subsequently withdrew the appeal, and the date to file appeals in the case has expired. The court decision from the Northern District of California does not have a current business impact on AquaBounty's egg production in Prince Edward Island, Canada, AquaBounty's salmon production in Albany, Indiana, or AquaBounty's sales of its fish.

The term "genetically engineered" will need to be included as part of the acceptable market name for our GE Atlantic salmon, and bioengineering disclosures will need to be provided at the retail level, in accordance with USDA regulations. These disclosures could negatively impact consumer acceptance.

Until the passage of the National Bioengineered Food Disclosure Law in July 2016, which contained the requirement to establish the Disclosure Standard, our GE Atlantic salmon did not need to be labeled as containing a bioengineered product, because it had been deemed to be "substantially equivalent" to the conventional product. However, because some states either passed or considered new laws specifying varying requirements for labeling products sold at the retail level that contain bioengineered ingredients, the United States Congress passed the National Bioengineered Food Disclosure Law in July 2016, requiring USDA to establish a mandatory standard for disclosing foods that are or may be bioengineered. USDA issued the National Bioengineered Food Disclosure Standard in December 2018. AquaBounty includes the bioengineered logo on its GE Atlantic salmon packaging, in accordance with the

Disclosure Standard. In addition, the 2020 Appropriations Act, which was signed into law in December 2019, which was reintroduced and passed in 2021 and 2022, contained an amendment that requires that any bioengineered animal approved by FDA prior to the effective date of the Disclosure Standard shall include the words "genetically engineered" prior to the existing acceptable market name. While the Company believes that this labeling requirement is unnecessary and redundant to the requirement of the Disclosure Standard, it complies with all applicable laws. Labeling requirements could cause consumers to view the label as either a warning or as an indication that GE Atlantic salmon is inferior to conventional Atlantic salmon, which could negatively impact consumer acceptance of our product.

Risks Relating to Intellectual Property

Competitors and potential competitors may develop products and technologies that make ours obsolete or garner greater market share than ours.

We do not believe that we have a direct competitor for bioengineered, growth-enhanced Atlantic salmon. However, the market for Atlantic salmon is dominated by a group of large, multinational corporations with entrenched distribution channels. Competitors may be able to reduce the grow-out times for their conventional sea-cage and RAS farming operations, thus lowering our competitive advantages and reducing their costs. Our ability to compete successfully will depend on our ability to demonstrate that our GE Atlantic salmon is superior to and/or less expensive than other products available in the market.

Certain of our competitors may be better funded than we are and/or benefit from government support and other incentives that are not available to us. At least in part due to these financial advantages, our competitors may be able to develop competing and/or superior products and compete more aggressively and sustain that competition over a longer period of time than we can. As more companies develop new intellectual property in our markets, a competitor could acquire patent or other rights that may limit our ability to successfully market our product.

If our technologies or products are stolen, misappropriated, or reverse engineered, others could use the technologies to produce competing technologies or products.

Third parties, including our collaborators, contractors, and others involved in our business often have access to, and may require that we grant interests in, our technologies. If our technologies or products were stolen, misappropriated, or reverse engineered, or if we are forced to grant broad interests in our technologies, they could be used by other parties that may be able to reproduce our technologies or products using our technologies for their own commercial gain. If this were to occur, it would be difficult for us to challenge this type of use, especially in countries with limited intellectual property protection. In addition, third parties granted interests in our technologies could seek to prevent or limit our use or commercialization of those technologies based on claims of partial ownership.

Our ability to compete may be negatively impacted if we do not adequately protect our proprietary technologies or if we lose some of our intellectual property rights.

Our success depends in part on our ability to obtain patents and maintain adequate protection of our intellectual property in the United States and abroad for our technologies and resultant products and potential products. We have adopted a strategy of seeking patent protection in the United States and abroad with respect to certain of the technologies used in or relating to our products; however, the patent to the technology covering our GE Atlantic salmon, which we license under a global, perpetual, royalty-free, non-exclusive license from Genesis Group, Inc., an affiliate of Memorial University of Newfoundland, and an affiliate of the Hospital for Sick Children of Toronto, expired in August 2013. We expect to protect our proprietary technology in regard to our GE Atlantic salmon through a combination of in-house know-how and the deterrence of the regulatory process that would need to be completed for a competing product to be commercialized, which we believe provides us with a competitive advantage. There can be no guarantee that this strategy will be successful.

We also rely on trade secrets to protect our technologies, particularly in cases when we believe patent protection is not appropriate or obtainable. However, trade secrets are difficult to protect, and we may not be able to adequately protect our trade secrets or other proprietary or licensed information. While we require our employees, academic collaborators, consultants, and other contractors to enter into confidentiality agreements with us, if we cannot maintain the confidentiality of our proprietary and licensed technologies and other confidential information, our ability and that of our licensor to receive patent protection, and our ability to protect valuable information owned or licensed by us may be imperiled.

Enforcing our intellectual property rights may be difficult and unpredictable.

Enforcing our intellectual property rights can be expensive and time consuming, and the outcome of such efforts can be unpredictable. If we were to initiate legal proceedings against a third party to enforce a patent covering one of our technologies, the defendant could counterclaim that our patent is invalid and/or unenforceable or assert that the patent does not cover its manufacturing processes, manufacturing components, or products. Furthermore, in patent litigation in the United States, defendant counterclaims alleging both invalidity and unenforceability are commonplace. Although we may believe that we have conducted our patent prosecution in accordance with the duty of candor and in good faith, the outcome following legal assertions of invalidity and unenforceability during patent litigation is unpredictable. With respect to the validity of our patent rights, we cannot be certain, for example, that there is no invalidating prior art, of which we and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we would not be able to exclude others from practicing the inventions claimed therein. Such a loss of patent protection could have a material adverse impact on our business. Even if our patent rights are found to be valid and enforceable, patent claims that survive litigation may not cover commercially valuable products or prevent competitors from importing or marketing products similar to our own, or using manufacturing processes or manufacturing components similar to those used to produce the products using our technologies.

Although we believe that we have obtained assignments of patent rights from all inventors, if an inventor did not adequately assign their patent rights to us, a third party could obtain a license to the patent from such inventor. This could preclude us from enforcing the patent against such third party.

We may not be able to enforce our intellectual property rights throughout the world.

The laws of some foreign countries do not protect intellectual property rights to the same extent as the laws of the United States. Many companies have encountered significant problems in protecting and defending intellectual property rights in certain foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, often do not favor the enforcement of patents and other intellectual property protection, particularly those relating to bioengineering. This could make it difficult for us to stop the infringement of our patents or misappropriation of our other intellectual property rights. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business. Accordingly, our efforts to protect our intellectual property rights in such countries may be inadequate.

Risks Relating to our Common Stock

The price of our shares of common stock is likely to be volatile.

The share price of publicly traded emerging companies can be highly volatile and subject to wide fluctuations. The prices at which our common stock is quoted and the prices which investors may realize will be influenced by a large number of factors, some specific to our company and operations and some that may affect the quoted land-based fish farming industry, the biotechnology sector, or quoted companies generally. These factors could include variations in our operating results, publicity regarding the process of obtaining regulatory approval to commercialize our products, divergence in financial results from analysts' expectations, changes in earnings estimates by stock market analysts, overall market or sector sentiment, legislative changes in our sector, the performance of our research and development programs, large purchases or sales of our common stock, currency fluctuations, legislative changes in the bioengineering environment, future sales of our common stock or the perception that such sales could occur and general economic conditions. Certain of these events and factors are outside of our control. Stock markets have from time to time experienced severe price and volume fluctuations, which, if recurring, could adversely affect the market prices for our common stock.

NASDAQ may delist our securities from quotation on its exchange which could limit investors' ability to make transactions in our securities and subject us to additional trading restrictions.

Our Common Stock is traded on the Nasdaq Stock Market LLC ("Nasdaq"), a national securities exchange. On October 31, 2022, we received a letter (the "Notice") from Nasdaq notifying us that, because the closing bid price for our common stock, par value $0.001 per share (the "Common Stock"), had been below $1.00 per share for the previous 30 consecutive business days, it no longer complied with the minimum bid price requirement for continued listing on the Nasdaq Capital Market. The Notice had no immediate effect on our listing on the Nasdaq Capital Market or on the trading of our Common Stock.

The Notice provided us with a compliance period of 180 calendar days, or until May 1, 2023, to regain compliance. If at any time during this 180-day compliance period the closing bid price of our Common Stock is at least $1.00 per share for a minimum of 10 consecutive business days, then Nasdaq may provide us with written confirmation of compliance and the matter will be closed. We intend to monitor the closing bid price of the Common Stock and may, if appropriate, evaluate

various courses of action to regain compliance. There can be no assurance that we will regain compliance or otherwise maintain compliance with the other listing requirements.

If we fail to maintain an effective system of internal control over financial reporting, we may not be able to accurately report our financial results or prevent fraud.

Effective internal controls over financial reporting are necessary for us to provide reliable financial reports and, together with adequate disclosure controls and procedures, are designed to prevent fraud. Any failure to implement required new or improved controls, or difficulties encountered in their implementation, could cause us to fail to meet our reporting obligations. In addition, any testing by us conducted in connection with Section 404 of the Sarbanes-Oxley Act, may reveal deficiencies in our internal controls over financial reporting that are deemed to be material weaknesses or that may require prospective or retroactive changes to our financial statements or identify other areas for further attention or improvement. Ineffective internal controls could also cause investors to lose confidence in our reported financial information, which could have a negative effect on the trading price of our common stock.

An active trading market for our common stock may not be sustained.

Although our common stock is currently traded on The Nasdaq Capital Market, an active trading market for our common stock may not be maintained. If an active market for our common stock is not maintained, it may be difficult for shareholders to sell shares of our common stock. An inactive trading market may impair our ability to raise capital to continue to fund operations by selling shares and may impair our ability to acquire other companies or technologies by using our shares as consideration.

If securities or industry analysts do not publish research or reports, or publish inaccurate or unfavorable research or reports about our business, our share price and trading volume could decline.

The U.S. trading market for our shares of common stock depends, in part, on the research and reports that securities or industry analysts publish about us or our business. We do not have any control over these analysts. If we obtain securities or industry analyst coverage, and one or more of the analysts who covers us downgrades our shares of common stock, changes their opinion of our shares, or publishes inaccurate or unfavorable research about our business, our share price would likely decline. If one or more of these analysts ceases coverage of us or fails to publish reports on us regularly, demand for our shares of common stock could decrease, and we could lose visibility in the financial markets, which could cause our share price and trading volume to decline.

Our share price and our ability to raise additional funds may depend on our success in growing, or our perceived ability to grow, our GE Atlantic salmon successfully and profitably at commercial scale.

We have not yet demonstrated that we can grow our GE Atlantic salmon successfully or profitably at commercial scale. If we are unsuccessful in growing our salmon to harvest size, achieving our quality standards and selling the fish in the market at a profit from our commercial-scale facilities, or are perceived as being unable to do so prior to commercial-scale harvest and sale, we may lose credibility with the investor community and other funding sources, which could negatively impact the price of our common stock and our ability to raise additional funds.

There can be no assurance that additional funds will be available on a timely basis, on favorable terms, or at all, or that such funds, if raised, would be sufficient to enable us to continue to implement our business strategy.

To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interests of holders of our common stock will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of holders of our common stock. Debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures, or declaring dividends. If we raise additional funds through government or other third-party funding; marketing and distribution arrangements; or other collaborations, strategic alliances, or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs, or product candidates or to grant licenses on terms that may not be favorable to us.

We are a "smaller reporting company" and a "non-accelerated filer" and we cannot be certain if applicable scaled disclosure requirements will make our shares of common stock less attractive to investors.

As a "smaller reporting company," we may elect to comply with scaled disclosure requirements relative to companies that are not smaller reporting companies, including but not limited to, reduced disclosure obligations regarding executive compensation in our filings with the SEC. Under current SEC rules, we will continue to qualify as a "smaller reporting company" for so long as (i) we

have a public float (i.e., the aggregate market value of common equity held by non-affiliates) of less than $250 million or (ii) our annual revenue is less than $100 million during the most recently completed fiscal year and the aggregate market value of our common stock held by non-affiliates is less than $700 million. In addition, under current SEC rules, we are not an "accelerated filer" and so not required to include an auditor attestation of the effectiveness of our internal control over financial reporting in this Annual Report on Form 10-K.

We cannot predict if investors will find our shares of common stock to be less attractive because we may rely on these exemptions. If some investors find our shares of common stock less attractive as a result, there may be a less active trading market for our shares of common stock, and our share price may be more volatile.

We may issue preferred stock with terms that could dilute the voting power or reduce the value of our common stock.

While we have no specific plan to issue preferred stock, our certificate of incorporation authorizes us to issue, without the approval of our shareholders, one or more series of preferred stock having such designation, relative powers, preferences (including preferences over our common stock respecting dividends and distributions), voting rights, terms of conversion or redemption, and other relative, participating, optional, or other special rights, if any, of the shares of each such series of preferred stock and any qualifications, limitations, or restrictions thereof, as our Board of Directors may determine. The terms of one or more classes or series of preferred stock could dilute the voting power or reduce the value of our common stock. For example, the repurchase or redemption rights or liquidation preferences we could assign to holders of preferred stock could affect the residual value of the common stock.

Provisions in our corporate documents and Delaware law could have the effect of delaying, deferring, or preventing a change in control of us, even if that change may be considered beneficial by some of our shareholders.

The existence of some provisions of our certificate of incorporation or our bylaws or Delaware law could have the effect of delaying, deferring, or preventing a change in control of us that a shareholder may consider favorable. These provisions include:

- providing that the number of members of our board is limited to a range fixed by our by-laws;
- establishing advance notice requirements for nominations of candidates for election to our Board of Directors or for proposing matters that can be acted on by shareholders at shareholder meetings; and
- authorizing the issuance of "blank check" preferred stock, which could be issued by our Board of Directors to issue securities with voting rights and thwart a takeover attempt.

As a Delaware corporation, we are also subject to provisions of Delaware law, including Section 203 of the General Corporation Law of the State of Delaware. Section 203 prevents some shareholders holding more than 15% of our voting stock from engaging in certain business combinations unless the business combination or the transaction that resulted in the shareholder becoming an interested shareholder was approved in advance by our Board of Directors, results in the shareholder holding more than 85% of our voting stock (subject to certain restrictions), or is approved at an annual or special meeting of shareholders by the holders of at least 66 2/3% of our voting stock not held by the shareholder engaging in the transaction. Any provision of our certificate of incorporation or our bylaws or Delaware law that has the effect of delaying or deterring a change in control could limit the opportunity for our shareholders to receive a premium for their shares of our common stock and affect the price that some investors are willing to pay for our common stock.

The financial reporting obligations of being a public company in the United States are expensive and time consuming and place significant additional demands on our management.

The obligations of being a public company in the United States place additional demands on our management and require significant expenditures, including costs resulting from public company reporting obligations under the Securities Exchange Act of 1934, as amended (the "Exchange Act"); the rules and regulations regarding corporate governance practices, including those under the Sarbanes-Oxley Act and the Dodd Frank Wall Street Reform and Consumer Protection Act; and the listing requirements for the Nasdaq Capital Market. Our management and other personnel devote a substantial amount of time to ensure that we comply with all of these requirements. Any changes that we make to comply with these obligations may not be sufficient to allow us to satisfy our obligations as a public company on a timely basis, or at all.

These rules and regulations make it more difficult and more expensive for us to obtain director and officer liability insurance, and we may be required to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. These factors also could make it more difficult for us to attract and retain qualified persons to serve on our Board of Directors, particularly to serve on our Audit Committee and Compensation Committee, or as executive officers.

We do not anticipate paying cash dividends in the foreseeable future, and, accordingly, shareholders must rely on stock appreciation for any return on their investment.

We have never declared or paid cash dividends on our common stock. We do not anticipate paying cash dividends in the foreseeable future and intend to retain all of our future earnings, if any, to finance the operations, development, and growth of our business. There can be no assurance that we will have sufficient surplus under Delaware law to be able to pay any dividends at any time in the future. As a result, absent payment of dividends, only appreciation of the price of our common stock, which may never occur, will provide a return to shareholders. You may also have to sell some or all of your shares of our common stock in order to generate cash flow from your investment in us.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Our corporate headquarters are located in Maynard, Massachusetts, and consist of approximately 3,500 square feet of office space under a month-to-month lease. We own a production grow-out farm in Indiana, which has the potential to produce 1,200 metric tons of our fish annually. On Prince Edward Island, Canada, we own a hatchery in Fortune Bay and a salmon farm in Rollo Bay, that consists of a hatchery, a broodstock facility, and a second broodstock facility that is currently under construction. In 2022, we purchased a parcel of land in Pioneer, Ohio on which we have commenced construction of a 479,000 square foot production grow-out farm. We believe that the spaces that we lease and own are sufficient to meet our current and near-term needs. See "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Item 3. Legal Proceedings

We are not party to any legal proceedings the outcome of which, we believe, if determined adversely to us, would individually or in the aggregate have a material adverse effect on our future business, consolidated results of operations, cash flows, or financial position. We may, from time to time, be subject to legal proceedings and claims arising from the normal course of business activities.

Item 4. Mine Safety Disclosures

Not applicable.

Part II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Market Information

Our common stock is currently traded on the Nasdaq Capital Market under the symbol "AQB." As of March 3, 2023, 71,110,713 shares of our common stock were issued and outstanding.

As of March 3, 2023, there were approximately 214 holders of record of our common stock. The actual number of shareholders is greater than this number and includes shareholders who are beneficial owners, but whose shares are held in street name by brokers and other nominees. The transfer agent for our common stock is Computershare Trust Company, N.A.

Dividends

We have never declared or paid any cash dividends on our common stock. We currently intend to retain earnings, if any, to finance the growth and development of our business. We do not expect to pay any cash dividends on our common stock in the foreseeable future. Payment of future dividends, if any, will be at the discretion of our Board of Directors and will depend on our financial condition, results of operations, capital requirements, restrictions contained in current or future financing instruments, provisions of applicable law, and other factors the Board of Directors deems relevant.

Securities Authorized for Issuance Under Equity Compensation Plans

The information under "Equity Compensation Plan Information" to be included in our definitive proxy statement relating to our 2023 annual meeting of stockholders to be filed with the SEC within 120 days after the end of our fiscal year ended December 31, 2022, is incorporated herein by reference.

Item 6. Reserved

Not Applicable.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and related notes that appear elsewhere in this Annual Report on Form 10-K. In addition to historical consolidated financial information, the following discussion contains forward-looking statements that reflect our plans, estimates, and beliefs. Our actual results could differ materially from those discussed in the forward-looking statements. Factors that could cause or contribute to these differences include those discussed below and elsewhere in this Annual Report on Form 10-K, particularly in "Risk Factors."

Overview

We believe that we are a distinctive brand in the field of land-based aquaculture, leveraging decades of technology expertise to deliver innovative solutions that address food insecurity and climate change issues, while improving efficiency and sustainability. We provide fresh Atlantic salmon to nearby markets by raising our fish in carefully monitored land-based fish farms through a safe, secure and sustainable process. Our land-based Recirculating Aquaculture System farms, located in Indiana in the United States and Prince Edward Island in Canada, are close to key consumption markets and are designed to prevent disease and to include multiple levels of fish containment to protect wild fish populations. We are raising nutritious salmon that is free of antibiotics and other contaminants and provides a solution with a reduced carbon footprint without the risk of pollution to marine ecosystems as compared to traditional sea-cage farming. Our primary product is our GE Atlantic salmon, which received FDA approval in 2015 as the first genetically engineered animal available for sale for human consumption. We commenced commercial activities in 2021 with operations in the United States and Canada. We are actively engaged in genetic, genomic, fish health and fish nutrition research, which drive continuous improvement in our operations and may lead to new, disruptive technologies and products that could further expand our competitive offerings.

COVID-19

Although the COVID-19 pandemic has diminished in the United States and other parts of the world as vaccines have become more readily available, variants of the virus continue to spread. Local governmental authorities in the United States and Canada have issued, and continue to update, directives aimed at minimizing the spread of the virus and we continue to monitor their status. Due to the pandemic, we have experienced delays and cost increases in capital projects, additional challenges in our efforts to meet the capacity expectations at our existing facilities and continue to experience extended lead times on equipment purchases.

Inflation

Recently elevated global inflation rates continue to impact all areas of our business. We are experiencing higher costs for farming supplies, transportation costs, wage rates, and other direct operating expenses. Additionally, inflation has impacted the cost estimates for our Ohio farm project, which is now expected to be in the range of $375 million to $395 million. We expect inflation to continue to negatively impact our results of operations for the near-term.

Financial Overview

We expect to generate product revenue primarily through the sales of our GE Atlantic salmon. We also sell conventional Atlantic salmon, salmon eggs, fry, and byproducts.

We expect our future capital requirements will be substantial, particularly as we continue to develop our business and expand our commercial activities, as discussed in "Liquidity and Capital Resources". During the next several years, we expect that our working capital requirements and our capital expenditures will increase substantially due to our plans to construct new land-based production farms.

Product Revenue

We currently generate product revenue through the sales of our GE Atlantic salmon, conventional Atlantic salmon eggs and fry, and salmon byproducts. We measure our harvest volume of GE Atlantic salmon in terms of metric tons ("mt") of live weight taken out of the water. We expect revenues to grow modestly in 2023 and in the future, we believe that our revenue will depend upon the number and capacity of grow-out farms we have in operation and the market acceptance we achieve.

Production Costs

Production costs include the labor and related costs to grow out our fish, including feed, oxygen, and other direct costs; overhead; and the cost to process and ship our products to customers. A portion of production costs is absorbed into inventory as fish in process to the extent that these costs do not exceed the net realizable value of the fish biomass. The costs that are not absorbed into inventory, as

well as any net realizable value inventory adjustments, are classified as production costs. Our production costs also include the labor and related costs to maintain our salmon broodstock. As of December 31, 2022 and 2021, we had seventy and sixty-one employees, respectively engaged in production activities.

Sales and Marketing Expenses

Our sales and marketing expenses currently include salaries and related costs for our sales personnel and consulting fees for market-related activities. During 2021, we also included the cost of our conventional salmon donation program. As of December 31, 2022 and 2021, we had two and one employees, respectively, dedicated to sales and marketing. We expect our sales and marketing expenses to increase as our production output and revenues grow.

Research and Development Expenses

As of December 31, 2022 and 2021, we employed twelve and nineteen scientists and technicians, respectively, at our facilities on Prince Edward Island to oversee the lines of fish we maintain for research and development purposes. We recognize research and development expenses as they are incurred. Our research and development expenses consist primarily of:

- salaries and related overhead expenses for personnel in research and development functions;
- fees paid to contract research organizations and consultants who perform research for us;
- costs related to laboratory supplies used in our research and development efforts; and
- costs related to the operation of our field trials.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries and related costs for employees in executive, corporate, and finance functions. Other significant general and administrative expenses include corporate governance and public company costs, regulatory affairs, rent and utilities, insurance, and legal services. We had sixteen and fourteen employees in our general and administrative group at December 31, 2022 and 2021, respectively.

Other Income (Expense), Net

Interest expense includes the interest on our outstanding loans and the amortization of debt issuance costs. Other income (expense) includes bank charges, fees, interest income, miscellaneous gains or losses on asset disposals and realized gains or losses on investments.

Critical Accounting Policies and Estimates

This Management's Discussion and Analysis of Financial Condition and Results of Operations is based on our consolidated financial statements, which we have prepared in accordance with GAAP. The preparation of our consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported revenues and expenses during the reporting periods. We evaluate these estimates and judgments on an ongoing basis. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Our actual results may differ from these estimates under different assumptions or conditions. While our significant accounting policies are more fully described in Note 2 to our audited consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K, we believe that the following accounting policies and estimates are the most critical for fully understanding and evaluating our financial condition and results of operations.

Inventories

Inventories are mainly comprised of feed, eggs, fry, fish in process and fish for sale. Fish in process inventory is a biological asset that is measured based on the estimated biomass of fish on hand. We have established a standard procedure to estimate the biomass of fish on hand using counting and sampling techniques. We measure inventory at the lower of cost or net realizable value ("NRV"), where NRV is defined as the estimated market price, less the estimated costs of processing, packaging and transportation. We consider fish that has been harvested and transported from its farm to be fish for sale.

Revenue Recognition

We generate revenue from the sale of our products. Revenue is recognized when the customer takes physical control of the goods, in an amount that reflects the transaction price consideration that we expect to receive in exchange for the goods. Revenue excludes any sales tax collected and includes any estimate of future credits.

Recent Accounting Pronouncements

We do not expect any recently issued, but not yet effective, accounting standards to have a material effect on our results of operations or financial condition.

Results of Operations

Comparison of the year ended December 31, 2022 to the year ended December 31, 2021.

The following table summarizes our results of operations for the years ended December 31, 2022 and 2021, together with the changes in those items in dollars (in thousands) and as a percentage:

	Year Ended December, 31		Dollar	%
	2022	2021	Change	Change
Product revenue	$ **3,137**	$ 1,175	1,962	167%
Operating expenses:				
Product costs	**13,630**	10,786	2,844	26%
Sales and marketing	**1,139**	1,262	(123)	(10)%
Research and development	**904**	2,146	(1,242)	(58)%
General and administrative	**9,787**	9,103	684	8%
Operating loss	**(22,323)**	(22,122)	(201)	1%
Total other (income) expense	**(166)**	201	(367)	(183)%
Net loss	$ **(22,157)**	$ (22,323)	166	(1)%

Product Revenue

Product revenue for the years ended December 31, 2022 and 2021 consisted of sales of our GE Atlantic salmon and conventional Atlantic salmon eggs, fry and byproducts. During the current year, we increased the volume of harvests of GE Atlantic salmon from our Indiana farm and completed the final harvests of GE Atlantic salmon from our Rollo Bay farm, as it began its transition into a broodstock facility. Our Indiana farm required extensive repairs to one of its buildings during Q4 of the current year, which impacted the number of fish that could be harvested and sold during the final two months of the year. Repairs commenced immediately on the building and no fish were impacted by the situation. However, we expect the repairs to continue into Q2 of 2023, which will continue to impact the number of fish harvested.

	Year Ended December 31,			%
	2022	2021	Change	Change
Harvest of GE Atlantic salmon (kg of live weight)	512,274	288,362	223,912	78%
Product revenue				
GE Atlantic salmon revenue	$ 2,914	$ 783	$ 2,131	272%
Non-GE Atlantic salmon revenue	187	391	(204)	(52)%
Other revenue	36	1	35	3,500%
Total product revenue	$ 3,137	$ 1,175	$ 1,962	167%

Production Costs

Production costs for the year ended December 31, 2022, were up from the corresponding period in 2021, due to production cost increases for labor and other direct costs related to increased production output. Increases included headcount additions, feed costs and other direct supplies, as well as the costs for processing and transportation to bring our product to market. These cost increases were partly offset by an increase in the NRV of the fish in process inventory, which allowed more production cost to be absorbed into inventory. The improvement in NRV was due to higher market pricing and lower costs per pound for transportation and processing.

Sales and Marketing Expenses

Sales and marketing expenses for the year ended December 31, 2022, were down from the corresponding period in 2021 primarily due to the non-recurrence of an expense incurred during 2021 related to the donation of conventional Atlantic salmon to local food charities. Net of this charge, sales and marketing expenses increased in the current period, due to an increase in headcount and marketing program costs.

Research and Development Expenses

Research and development expenses for the year ended December 31, 2022, were down from the corresponding period in 2021 due to the transition of broodstock husbandry costs to production operations. Net of this change, research and development expenses for the current period remained relatively unchanged as compared with the prior period. Cost increases for headcount and lab supplies were offset by decreases in field trials and outside contract service fees. During the current period, research activities included feed

nutrition trials, discovery research in salmon immunology and work on a genome study to identify genes associated with economically important traits in salmon.

General and Administrative Expenses

General and administrative expenses for the year ended December 31, 2022, were up from the corresponding period in 2021 due to increases in personnel, auditing and legal fees, insurance costs, taxes and stock compensation charges, partly offset by decreases in consulting and outside advisory fees.

Total Other (Income) Expense

Total other (income) expense for 2022 is comprised of interest income, interest on debt, bank charges, and a loss on the disposal of assets. Total other (income) expense for 2021 is comprised of interest income, interest on debt and bank charges. Interest income in 2022 was up considerably over 2021, due to our investments in marketable securities.

Liquidity and Capital Resources

Sources of Liquidity

We have incurred losses from operations since our inception in 1991, and, as of December 31, 2022, we had an accumulated deficit of $193 million. We expect to continue to experience losses from operations for the foreseeable future and we will require substantial additional cash to fund our business plans. Liquidity has primarily come from equity financings, supplemented by debt transactions.

During 2021, we completed a public equity offering of 14,950,000 shares of common stock for net proceeds of approximately $119.1 million and we issued 530,414 shares of common stock through the conversion of outstanding warrants for total proceeds of $1.7 million. During 2022, we received $476 thousand in debt proceeds from the draw-down on an existing loan facility.

In the future, we expect to use bond issuances to fund the construction of our farms and we may use additional equity issuances to supplement these costs or to fund other growth opportunities.

As of December 31, 2022, we had $102.6 million in cash and cash equivalents, and restricted cash.

Our principal contractual commitments include capital expenditure obligations, repayments of debt and related interest, and payments under operating leases. Refer to the notes in our consolidated financial statements for further information about our capital expenditure commitments (Note 6), debt (Note 7), and lease payment obligations (Note 10).

Cash Flows

The following table sets forth the significant sources and uses of cash for the periods set forth below (in thousands):

	Year Ended December 31,		Dollar	%
	2022	2021	Change	Change
Net cash (used in) provided by:				
Operating activities	$ **(21,007)**	$ (20,472)	(535)	3%
Investing activities	**34,350**	(107,539)	141,889	(132)%
Financing activities	**(162)**	121,179	(121,341)	(100)%
Effect of exchange rate changes on cash	**3**	36	(33)	(92)%
Net increase in cash	$ **13,184**	$ (6,796)	19,980	(294)%

Cash Flows from Operating Activities

Net cash used in operating activities during the year ended December 31, 2022, was primarily comprised of our $22.2 million net loss, offset by non-cash depreciation and stock compensation charges of $2.6 million and increased by working capital uses of $1.4 million. Spending on operations increased in 2022 due to increases in production activities at our Rollo Bay and Indiana farm sites, increases in headcount and increases in costs for insurance, taxes, and professional fees. Cash used for working capital was due primarily to increases in inventory and prepaid expenses, partially offset by an increase in accrued expenses. We expect cash flows from operating activities to remain negative and roughly consistent until our Ohio farm is in operation.

Net cash used in operating activities during the year ended December 31, 2021, was primarily comprised of our $22.3 million net loss, offset by non-cash depreciation and stock compensation charges of $2.2 million and increased by working capital uses of $349 thousand. Spending on operations increased in 2021 due to increases in production activities at our Rollo Bay and Indiana farm sites and outside consulting and advisory fees. Cash used for working capital was due primarily to increases in receivables and prepaid expenses, partially offset by increases in accounts payable and accrued expenses and a decrease in inventory.

Cash Flows from Investing Activities

During 2022, we used $65.1 million for construction charges and equipment deposits for our Ohio farm, $1.4 million and $1.0 million for equipment purchases and deposits for our Indiana and Rollo Bay farms, respectively, and we received $101.8 million on the net sales of marketable securities.

During 2021, we used $5.7 million for renovations to our Indiana farm and Fortune Bay hatchery sites and for construction charges at our Rollo Bay farm, $45 thousand for deposits on equipment purchases and $101.8 million on the net purchase of marketable securities.

We expect expenditures on capital projects to increase in future periods as we continue construction of our Ohio farm. For more information, see "*Our business plans include the need for substantial additional capital and without it we may not be able to implement our strategy as planned or at all*."

Cash Flows from Financing Activities

During 2022, we received approximately $476 thousand in proceeds from new debt and we repaid $640 thousand of outstanding debt.

During 2021, we received approximately $119.1 million in net proceeds from the issuance of shares of common stock in a public equity offering, $1.7 million from the exercise of warrants, and $606 thousand from new debt. This was offset by $272 thousand in debt repayment.

Future Capital Requirements

In February 2021, we completed an equity raise with net proceeds of $119.1 million and we had $102.6 million of cash, cash equivalents, and restricted cash as of December 31, 2022. Our plans include the continued construction of a 10,000 metric ton salmon farm in Ohio at a total project cost that is estimated to range from $375 million to $395 million. We plan to use cash-on-hand and debt financing to fund the construction. While we have committed a significant amount of our current cash to fund a portion of the project, if necessary, we can utilize that cash for working capital purposes, and therefore we believe we have sufficient cash to meet our requirements for at least the next twelve months from the filing date of these consolidated financial statements.

In 2020, we entered into a term loan agreement with First Farmers Bank and Trust in the amount of $4 million, which is secured by the assets of our Indiana subsidiary and a corporate guarantee. The agreement contains certain financial and non-financial covenants, which if not met, could result in an event of default pursuant to the terms of the loan. At December 31, 2022, the Indiana subsidiary was in compliance with its loan covenants. The ability of the Indiana subsidiary to meet its debt covenants over the next twelve months is dependent upon its operating performance.

Until such time, if ever, as we can generate positive operating cash flows, we may finance our cash needs through a combination of equity offerings, debt financings, government or other third-party funding, strategic alliances, and licensing arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interests of holders of our common stock will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of holders of our common stock. Debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures, or declaring dividends. If we raise additional funds through government or other third-party funding; marketing and distribution arrangements; or other collaborations, strategic alliances, or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs, or product candidates or to grant licenses on terms that may not be favorable to us.

If we are unable to generate additional funds in the future through financings, sales of our products, government grants, loans, or from other sources or transactions, we will exhaust our resources and will be unable to maintain our currently planned operations. If we cannot continue as a going concern, our stockholders would likely lose most or all of their investment in us.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

The following sections provide quantitative information on our exposure to interest rate risk and foreign currency exchange risk. We make use of sensitivity analyses, which are inherently limited in estimating actual losses in fair value that can occur from changes in market conditions.

Interest Rate Risk

Our primary exposure to market risk is interest rate risk associated with debt financing that we utilize from time to time to fund operations or specific projects. The interest on this debt is usually determined based on a fixed rate and is contractually set in advance. As of December 31, 2022 and 2021, we had $5.1 million and $5.8 million, respectively, in interest-bearing debt instruments on our consolidated balance sheet. All of our interest-bearing debt is at fixed rates, except for our loan with First Farmers' Bank and Trust which has a rate reset in July 2025.

Foreign Currency Exchange Risk

Our functional currency is the U.S. Dollar. The functional currency of our Canadian subsidiary is the Canadian Dollar, and the functional currency of our U.S. and Brazil subsidiaries is the U.S. Dollar. For the Canadian subsidiary, assets and liabilities are translated at the exchange rates in effect at the balance sheet date, equity accounts are translated at the historical exchange rate, and the income statement accounts are translated at the average rate for each period during the year. Net translation gains or losses are adjusted directly to a separate component of other comprehensive loss within shareholders' equity.

Item 8. Financial Statements and Supplementary Data

The financial statements required by this Item are located beginning on page F-1 of this Annual Report.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

We maintain disclosure controls and procedures that are designed to ensure that information required to be disclosed in the reports that we file or submit under the Securities and Exchange Act of 1934 is (1) recorded, processed, summarized, and reported within the time periods specified in the Securities and Exchange Commission's rules and forms and (2) accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, to allow timely decisions regarding required disclosure. As of December 31, 2022 (the "Evaluation Date"), our management, with the participation of our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities and Exchange Act of 1934). Our management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives, and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Our Chief Executive Officer and Chief Financial Officer have concluded based upon the evaluation described above that, as of the Evaluation Date, our disclosure controls and procedures were effective at the reasonable assurance level.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting for our company. Internal control over financial reporting is defined in Rules 13a-15(f) and 15(d)-15(f) promulgated under the Securities Exchange Act of 1934, as amended, as a process designed by, or under the supervision of, our Chief Executive and Chief Financial Officers and effected by our board of directors, management, and other personnel to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles and includes those policies and procedures that:

- pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and disposition of our assets;
- provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles;
- provide reasonable assurance that our receipts and expenditures are being made only in accordance with authorization of our management and directors; and
- provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of our assets that could have a material effect on the financial statements.

Because of inherent limitations, internal controls over financial reporting may not prevent or detect misstatements. Projections of any evaluation of effectiveness to future periods are subject to the risks that controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

Our management, including our Chief Executive Officer and Chief Financial Officer, has conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2022. In conducting this evaluation, we used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in Internal Control-Integrated Framework (2013).

Based upon this evaluation and those criteria, management believes that, as of December 31, 2022, our internal controls over financial reporting were effective.

This Annual Report on Form 10-K does not include an auditor's attestation of management's assessment of internal controls over financial reporting as of December 31, 2022, as we are not an "accelerated filer" under SEC rules.

Changes in Internal Control

There have been no changes in our internal control over financial reporting for the quarter ended December 31, 2022, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

Not applicable.

Part III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this Item is set forth in our 2023 Proxy Statement to be filed with the SEC within 120 days of December 31, 2022, and is incorporated by reference into this Annual Report on Form 10-K.

Item 11. Executive Compensation

The information required by this Item is set forth in our 2023 Proxy Statement to be filed with the SEC within 120 days of December 31, 2022, and is incorporated by reference into this Annual Report on Form 10-K.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information required by this Item is set forth in our 2023 Proxy Statement to be filed with the SEC within 120 days of December 31, 2022, and is incorporated by reference into this Annual Report on Form 10-K.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required by this Item is set forth in our 2023 Proxy Statement to be filed with the SEC within 120 days of December 31, 2022, and is incorporated by reference into this Annual Report on Form 10-K.

Item 14. Principal Accounting Fees and Services

The information required by this Item is set forth in our 2023 Proxy Statement to be filed with the SEC within 120 days of December 31, 2022 and is incorporated by reference into this Annual Report on Form 10-K, for Deloitte & Touche LLP (PCAOB ID No. 34).

Part IV

Item 15. Exhibits and Financial Statement Schedules

List of Documents Filed as Part of this Report

1. Consolidated Financial Statements

The following consolidated financial statements are filed herewith in accordance with Item 8 of Part II above:

(i) Report of Independent Registered Public Accounting Firm

(ii) Consolidated Balance Sheets

(iii) Consolidated Statements of Operations and Comprehensive Loss

(iv) Consolidated Statements of Changes in Stockholders' Equity

(v) Consolidated Statements of Cash Flows

(vi) Notes to Consolidated Financial Statements

2. Schedules

Schedules not listed are omitted because the required information is inapplicable or is presented in the consolidated financial statements.

3. Exhibits

Exhibit Number	Exhibit Description
3.1*	Third Amended and Restated Certificate of Incorporation of AquaBounty Technologies, Inc. (incorporated by reference to Exhibit 3.1 to the Registrant's Registration Statement on Form 10, filed on November 7, 2016).
3.2*	Certificate of Amendment of Third Amended and Restated Certificate of Incorporation of AquaBounty Technologies, Inc. (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed on January 6, 2017).
3.3*	Certificate of Amendment of Third Amended and Restated Certificate of Incorporation of AquaBounty Technologies, Inc. (incorporated by reference to Exhibit 3.3 to the Registrant's Registration Statement on Form S-1, filed on January 15, 2020).
3.4*	Certificate of Amendment of Third Amended and Restated Certificate of Incorporation of AquaBounty Technologies, Inc. (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed on November 19, 2020).
3.5*	Certificate of Amendment of Third Amended and Restated Certificate of Incorporation of AquaBounty Technologies, Inc. (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed on May 27, 2022).
3.6*	Certificate of Validation dated October 18, 2022 relating to Certificate of Amendment to the Third Amended and Restated Certificate of Incorporation of AquaBounty Technologies, Inc. dated May 27, 2022 (incorporated by reference to Exhibit 3.5 to the Registrant's Quarterly Report on Form 10-Q, filed on November 8, 2022).
3.7*	Amended and Restated Bylaws of AquaBounty Technologies, Inc. (incorporated by reference to Exhibit 3.2 to the Registrant's Registration Statement on Form 10, filed on November 7, 2016).
4.1*	Specimen Certificate of Common Stock (incorporated by reference to Exhibit 4.1 to the Registrant's Registration Statement on Form 10, filed on November 7, 2016).
4.2*	Specimen Common Stock Purchase Warrant (incorporated by reference to Exhibit 4.2 to the Registrant's Registration Statement on Form S-1, filed on January 9, 2018).
4.3*	Description of Registrant's securities. (incorporated by reference to Exhibit 4.3 to the Registration's Annual Report on Form 10-K, filed on March 10, 2020).
10.1*	Stock Purchase Agreement, by and between AquaBounty Technologies, Inc. and Intrexon Corporation, dated November 7, 2016 (incorporated by reference to Exhibit 10.1 to the Registrant's Registration Statement on Form 10, filed on November 7, 2016).
10.2*†	AquaBounty Technologies, Inc. 2006 Equity Incentive Plan (incorporated by reference to Exhibit 10.2 to the Registrant's Registration Statement on Form 10, filed on November 7, 2016).
10.3*†	Amendment No. 1 to AquaBounty Technologies, Inc. 2006 Equity Incentive Plan (incorporated by reference to Exhibit 10.3 to the Registrant's Registration Statement on Form 10, filed on November 7, 2016).
10.4*†	Form of Stock Option Agreement pursuant to AquaBounty Technologies, Inc. 2006 Equity Incentive Plan (incorporated by reference to Exhibit 10.4 to the Registrant's Registration Statement on Form 10, filed on November 7, 2016).
10.5*†	Form of Restricted Stock Agreement pursuant to AquaBounty Technologies, Inc. 2006 Equity Incentive Plan (incorporated by reference to Exhibit 10.5 to the Registrant's Registration Statement on Form 10, filed on November 7, 2016).
10.6*†	AquaBounty Technologies, Inc. 2016 Equity Incentive Plan (incorporated by reference to Exhibit 10.6 to the Registrant's Registration Statement on Form 10, filed on November 7, 2016).
10.7*†	Amendment No. 1 to AquaBounty Technologies, Inc. 2016 Equity Incentive Plan (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K, filed on May 2. 2019).
10.8*†	Amendment No. 2 to AquaBounty Technologies, Inc. 2016 Equity Incentive Plan (incorporated by reference to Exhibit 10.3 to the Registrant's Current Report on Form 8-K, filed on April 29, 2020).
10.9*†	Form of Stock Option Agreement pursuant to AquaBounty Technologies, Inc. 2016 Equity Incentive Plan (incorporated by reference to Exhibit 10.22 to the Registrant's Registration Statement on Form 10, filed on December 12, 2016).
10.10*†	Form of Restricted Stock Purchase Agreement pursuant to AquaBounty Technologies, Inc. 2016 Equity Incentive Plan (incorporated by reference to Exhibit 10.21 to the Registrant's Registration Statement on Form 10, filed on December 12, 2016).

10.11*	Form of Warrant Exercise Agreement, by and between AquaBounty Technologies, Inc. and certain holders of its Common Stock Purchase Warrants, dated October 24, 2018 (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed on October 25, 2018).
10.12*	Agreement, by and among Atlantic Canada Opportunities Agency and AQUA Bounty Canada Inc. and AquaBounty Technologies Inc., dated December 16, 2009 (incorporated by reference to Exhibit 10.14 to the Registrant's Registration Statement on Form 10, filed on November 7, 2016).
10.13*	Offer Letter, dated as of July 10, 2018, from Prince Edward Island Century 2000 Fund Inc. to AQUA Bounty Canada Inc. and accepted by AQUA Bounty Canada Inc. and AquaBounty Technologies, Inc. on August 20, 2018 (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q, filed on November 2, 2018).
10.14*	Negotiable Promissory Note, dated as of October 16, 2018, issued by AQUA Bounty Canada Inc. in favor of Prince Edward Island Century 2000 Fund Inc. (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q, filed on November 2, 2018).
10.15*	Collateral Mortgage dated as of July 26, 2016, by and between AQUA Bounty Canada Inc. and Prince Edward Island Century 2000 Fund Inc. (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q, filed on November 2, 2018).
10.16*	Collateral Mortgage, dated as of October 9, 2018, by and between AQUA Bounty Canada Inc. and Prince Edward Island Century 2000 Fund Inc. (incorporated by reference to Exhibit 10.4 to the Registrant's Quarterly Report on Form 10-Q, filed on November 2, 2018).
10.17*	General Security Agreement, dated as of July 26, 2016, by and between AQUA Bounty Canada Inc. and Prince Edward Island Century 2000 Fund Inc. (incorporated by reference to Exhibit 10.5 to the Registrant's Quarterly Report on Form 10-Q, filed on November 2, 2018).
10.18*	Guarantee, dated as of October 9, 2018, made by AquaBounty Technologies, Inc. in favor of Prince Edward Island Century 2000 Fund Inc. (incorporated by reference to Exhibit 10.6 to the Registrant's Quarterly Report on Form 10-Q, filed on November 2, 2018).
10.19*†	Executive Employment Agreement, by and between Sylvia Wulf and AquaBounty Technologies, Inc., dated November 27, 2018 (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed on November 28, 2018).
10.20*†	Employment Agreement, by and between David Frank and AquaBounty Technologies, Inc., dated October 1, 2007 (incorporated by reference to Exhibit 10.16 to the Registrant's Registration Statement on Form 10, filed on November 7, 2016).
10.21*†	Employment Agreement, by and between Alejandro Rojas and AquaBounty Technologies, Inc., dated December 30, 2013 (incorporated by reference to Exhibit 10.17 to the Registrant's Registration Statement on Form 10, filed on November 7, 2016).
10.22*	Intellectual Property License and Full and Final Release among Genesis Group Inc., HSC Research and Development Partnership and AquaBounty Technologies, Inc., dated February 28, 2014 (incorporated by reference to Exhibit 10.19 to the Registrant's Registration Statement on Form 10, filed on November 7, 2016).
10.23*	Asset Purchase Agreement by and between AquaBounty Technologies, Inc. and Bell Fish Company LLC, dated as of June 9, 2017 (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q, filed on August 4, 2017).
10.24*#	Loan and Security Agreement by and between AquaBounty Farms Indiana LLC and First Farmers Bank and Trust, dated as of July 31, 2020 (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q, filed on August 6, 2020).
10.30*	Term Note granted by AquaBounty Farms Indiana LLC in favor of First Farmers Bank and Trust, dated as of July 31, 2020 (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q, filed on August 6, 2020).
10.25*	Mortgage, Assignment of Rents and Leases, Security Agreement, Fixture Filing and Financing Statement granted by AquaBounty Technologies, Inc. in favor of First Farmers Bank and Trust, dated as of July 31, 2020 (incorporated by reference to Exhibit 10.4 to the Registrant's Quarterly Report on Form 10-Q, filed on August 6, 2020).
10.26*	Guarantor Security Agreement by and between AquaBounty Technologies, Inc. and First Farmers Bank and Trust, dated as of July 31, 2020 (incorporated by reference to Exhibit 10.5 to the Registrant's Quarterly Report on Form 10-Q, filed on August 6, 2020).
10.27*	Unconditional and Continuing Secured Guaranty Agreement by and between AquaBounty Technologies, Inc. and First Farmers Bank and Trust, dated as of July 31, 2020 (incorporated by reference to Exhibit 10.6 to the Registrant's Quarterly Report on Form 10-Q, filed on August 6, 2020).
10.28*	Collateral Access Agreement by and between AquaBounty Technologies, Inc. and First Farmers Bank and Trust, dated as of July 31, 2020 (incorporated by reference to Exhibit 10.7 to the Registrant's Quarterly Report on Form 10-Q, filed on August 6, 2020).

10.29*	Unconditional and Continuing Guaranty Agreement by and between AquaBounty Farms, Inc. and First Farmers Bank and Trust, dated as of July 31, 2020 (incorporated by reference to Exhibit 10.8 to the Registrant's Quarterly Report on Form 10-Q, filed on August 6, 2020).
10.30*	Environmental Indemnity Agreement by and among AquaBounty Technologies, Inc., AquaBounty Farms Indiana LLC and First Farmers Bank and Trust, dated as of July 31, 2020 (incorporated by reference to Exhibit 10.9 to the Registrant's Quarterly Report on Form 10-Q, filed on August 6, 2020).
10.31*	Letter Agreement between AquaBounty Technologies, Inc. and Third Security And its affiliates dated July 30, 2021 (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q, filed on November 4, 2021).
16.1*	Letter from Wolf & Company, P.C. dated July 6, 2021 (incorporated by reference to Exhibit 16.1 to the Registrant's Current Report on Form 8-K, filed July 7, 2021).
21.1	List of Subsidiaries of AquaBounty Technologies, Inc.
23.1	Consent of Deloitte & Touche LLP
23.2	Consent of Wolf & Company, P.C.
31.1	Certification of the Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification of the Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1	Certification of the Chief Executive Officer and Chief Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	Inline XBRL instance document-the instance document does not appear in the Interactive Data File because XBRL tags are embedded within the Inline XBRL document.
101.SCH	Inline XBRL taxonomy extension schema document.
101.CAL	Inline XBRL taxonomy extension calculation linkbase document.
101.DEF	Inline XBRL taxonomy extension definition linkbase document.
101.LAB	Inline XBRL taxonomy label linkbase document.
101.PRE	Inline XBRL taxonomy extension presentation linkbase document.
104	Cover Page Interactive Data File (formatted as Inline XBRL with applicable taxonomy extension information contained in exhibit 101).

*Incorporated herein by reference as indicated.

Schedules, exhibits, and similar supporting attachments or agreements to the Loan and Security Agreement are omitted pursuant to Item 601(b)(2) of Regulation S-K. The Registrant agrees to furnish a supplemental copy of any omitted schedule or similar attachment to the Securities and Exchange Commission upon request.

†Management contract or compensatory plan or arrangement.

The registrant hereby undertakes to file with the Securities and Exchange Commission, upon request, copies of any constituent instruments defining the rights of holders of long-term debt of the registrant or its subsidiaries that have not been filed herewith because the amounts represented thereby are less than 10% of the total assets of the registrant and its subsidiaries on a consolidated basis.

Item 16. Form 10-K Summary

Not applicable.

Signatures

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

AQUABOUNTY TECHNOLOGIES, INC.

By: /s/ Sylvia A. Wulf
Sylvia A. Wulf
Chief Executive Officer, President, and Director

Power of Attorney

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints David A. Frank and Angela M. Olsen, as his or her attorneys-in-fact, each with the power of substitution, for him or her in any and all capacities, to sign any amendment to this Annual Report on Form 10-K, and to file the same, with exhibits thereto and other documents in connection therewith with the Securities and Exchange Commission, hereby ratifying and confirming all that each of said attorneys-in-fact, or his substitute or substitutes, may do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Company and in the capacities and on the dates indicated below.

Signature	Title	Date
/s/ Sylvia A. Wulf Sylvia A. Wulf	President, Chief Executive Officer and Director (Principal Executive Officer)	March 7, 2023
/s/ David A. Frank David A. Frank	Chief Financial Officer and Treasurer (Principal Financial Officer and Principal Accounting Officer)	March 7, 2023
/s/ Richard J. Clothier Richard J. Clothier	Chairman of the Board, Director	March 7, 2023
/s/ Ricardo Alvarez Ricardo Alvarez	Director	March 7, 2023
/s/ Erin Sharp Erin Sharp	Director	March 7, 2023
/s/ Gail Sharps Myers Gail Sharps Myers	Director	March 7, 2023
/s/ Christine St.Clare Christine St.Clare	Director	March 7, 2023
/s/ Rick Sterling Rick Sterling	Director	March 7, 2023
/s/ Michael Stern Michael Stern	Director	March 7, 2023

Report of Independent Registered Public Accounting Firm

To the shareholders and the Board of Directors of AquaBounty Technologies, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of AquaBounty Technologies, Inc. and subsidiaries (the "Company") as of December 31, 2022 and 2021, the related consolidated statements of operations and comprehensive loss, changes in stockholders' equity, and cash flows, for the years then ended, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2022 and 2021, and the results of its operations and its cash flows for the years then ended, in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company’s internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current-period audit of the financial statements that was communicated or required to be communicated to the audit committee and that (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter, in any way, our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Inventory – Fish in Process – Refer to Notes 2 and 5 to the financial statements

Critical Audit Matter Description

Fish in process inventory is measured at the lower of cost or net realizable value. The Company’s determination of net realizable value of fish in process inventory requires management to make various estimates and assumptions related to the calculation of the biomass, including expected yield, market value of biomass and estimated costs of processing, packaging and transportation. Changes in these assumptions could have a significant impact on the net realizable value of fish in process inventory.

Given the determination of net realizable value requires management to make significant estimates and assumptions relating to yield, market value and future costs, performing audit procedures to evaluate the reasonableness of such estimates and assumptions required a high degree of auditor judgment and an increased extent of effort.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to fish in process inventory included the following, among others:

- We tested the design and implementation of the Company's inventory controls, including the review of the net realizable value estimate and assumptions.
- We evaluated management's process for determining the net realizable value of fish in process inventory.
- We observed and tested the Company’s physical inventory inspection and fish weighing processes near December 31, 2022.
- We tested the completeness and accuracy of management's estimates and assumptions within the net realizable value calculation by comparing expected:
    - Sales amounts to historical revenue.
    - Processing, packaging and transportation costs to historical amounts.
    - Market value to historical sales prices and market benchmarks.
    - Yield to the Company's historical results and industry peer data.
- We tested the changes in fish in process biomass from our physical observation date to December 31, 2022.

/s/ Deloitte & Touche LLP
Baltimore, Maryland
March 7, 2023

We have served as the Company's auditor since 2021.

AquaBounty Technologies, Inc.

Consolidated Balance Sheets

	As of December 31,	
	2022	**2021**
Assets		
Current assets:		
Cash and cash equivalents	$ **101,638,557**	$ 88,454,988
Marketable securities	**—**	101,773,781
Inventory	**2,276,592**	1,259,910
Prepaid expenses and other current assets	**2,133,583**	1,536,484
Total current assets	**106,048,732**	193,025,163
Property, plant and equipment, net	**106,286,186**	33,815,119
Right of use assets, net	**222,856**	284,320
Intangible assets, net	**218,139**	231,842
Restricted cash	**1,000,000**	1,000,000
Other assets	**64,859**	79,548
Total assets	$ **213,840,772**	$ 228,435,992
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable and accrued liabilities	$ **12,000,592**	$ 4,317,615
Accrued employee compensation	**1,021,740**	874,589
Current debt	**2,387,231**	627,365
Other current liabilities	**20,830**	66,269
Total current liabilities	**15,430,393**	5,885,838
Long-term lease obligations	**203,227**	224,058
Long-term debt, net	**6,286,109**	8,523,333
Total liabilities	**21,919,729**	14,633,229
Commitments and contingencies		
Stockholders' equity:		
Common stock, $0.001 par value, 150,000,000 and 80,000,000 shares authorized at December 31, 2022 and 2021, respectively; 71,110,713 and 71,025,738 shares outstanding at December 31, 2022 and 2021, respectively	**71,111**	71,026
Additional paid-in capital	**385,388,684**	384,852,107
Accumulated other comprehensive loss	**(516,775)**	(255,588)
Accumulated deficit	**(193,021,977)**	(170,864,782)
Total stockholders' equity	**191,921,043**	213,802,763
Total liabilities and stockholders' equity	$ **213,840,772**	$ 228,435,992

See accompanying notes to the consolidated financial statements.

AquaBounty Technologies, Inc.

Consolidated Statements of Operations and Comprehensive Loss

	Years ended December 31,	
	2022	**2021**
Revenues		
Product revenues	**$ 3,136,954**	$ 1,174,832
Costs and expenses		
Product costs	**13,630,911**	10,786,072
Sales and marketing	**1,138,781**	1,261,764
Research and development	**903,981**	2,145,548
General and administrative	**9,786,819**	9,103,213
Total costs and expenses	**25,460,492**	23,296,597
Operating loss	**(22,323,538)**	(22,121,765)
Other income (expense)		
Interest expense	**(291,177)**	(316,442)
Other income (expense), net	**457,520**	115,619
Total other income (expense)	**166,343**	(200,823)
Net loss	**$ (22,157,195)**	$ (22,322,588)
Other comprehensive income (loss):		
Foreign currency	**(301,288)**	51,771
Unrealized gains (losses) on marketable securities	**40,101**	(40,101)
Total other comprehensive income	**(261,187)**	11,670
Comprehensive loss	**$ (22,418,382)**	$ (22,310,918)
Basic and diluted net loss per share	**$ (0.31)**	$ (0.32)
Weighted average number of common shares - basic and diluted	**71,068,515**	69,428,061

See accompanying notes to the consolidated financial statements.

AquaBounty Technologies, Inc.

Consolidated Statements of Changes in Stockholders' Equity

	Common stock issued and outstanding	Par value	Additional paid-in capital	Accumulated other comprehensive loss	Accumulated deficit	Total
Balance as of December 31, 2020	55,497,133	$ 55,497	$ 263,629,116	$ (267,258)	$ (148,542,194)	$ 114,875,161
Net loss					(22,322,588)	(22,322,588)
Other comprehensive income				11,670		11,670
Cashless exercise of options for common stock	4,354	4	(4)			—
Issuance of common stock, net of expenses	14,950,000	14,950	119,105,487			119,120,437
Exercise of warrants for common stock	530,414	530	1,723,316			1,723,846
Share based compensation	43,837	45	394,192			394,237
Balance as of December 31, 2021	71,025,738	$ 71,026	$ 384,852,107	$ (255,588)	$ (170,864,782)	$ 213,802,763
Net loss					**(22,157,195)**	**(22,157,195)**
Other comprehensive (loss)				**(261,187)**		**(261,187)**
Exercise of options for common stock	**1,012**	**1**	**1,538**			**1,539**
Share based compensation	**83,963**	**84**	**535,039**			**535,123**
Balance at December 31, 2022	**71,110,713**	**$ 71,111**	**$ 385,388,684**	**$ (516,775)**	**$ (193,021,977)**	**$ 191,921,043**

See accompanying notes to the consolidated financial statements.

AquaBounty Technologies, Inc.

Consolidated Statements of Cash Flows

	Years Ended December 31,	
	2022	**2021**
Operating activities		
Net loss	**$ (22,157,195)**	$ (22,322,588)
Adjustment to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	**2,024,783**	1,787,564
Share-based compensation	**535,123**	394,237
Other non-cash charge	**22,983**	17,386
Changes in operating assets and liabilities:		
Inventory	**(1,027,650)**	267,833
Prepaid expenses and other assets	**(550,120)**	(1,138,691)
Accounts payable and accrued liabilities	**(1,905)**	230,712
Accrued employee compensation	**147,151**	291,288
Net cash used in operating activities	**(21,006,830)**	(20,472,259)
Investing activities		
Purchases of and deposits on property, plant and equipment	**(67,476,327)**	(5,713,807)
Maturities of marketable securities	**149,435,173**	86,488,271
Purchases of marketable securities	**(47,621,291)**	(188,302,153)
Other investing activities	**12,500**	(11,010)
Net cash provided by (used in) investing activities	**34,350,055**	(107,538,699)
Financing activities		
Proceeds from issuance of debt	**476,228**	606,453
Repayment of term debt	**(640,170)**	(272,102)
Proceeds from the issuance of common stock, net	**—**	119,120,437
Proceeds from the exercise of stock options and warrants	**1,538**	1,723,846
Net cash (used in) provided by financing activities	**(162,404)**	121,178,634
Effect of exchange rate changes on cash, cash equivalents and restricted cash	**2,748**	36,152
Net change in cash, cash equivalents and restricted cash	**13,183,569**	(6,796,172)
Cash, cash equivalents and restricted cash at beginning of period	**89,454,988**	96,251,160
Cash, cash equivalents and restricted cash at end of period	**$ 102,638,557**	$ 89,454,988
Reconciliation of cash, cash equivalents and restricted cash reported in the consolidated balance sheet:		
Cash and cash equivalents	**$ 101,638,557**	$ 88,454,988
Restricted cash	**1,000,000**	1,000,000
Total cash, cash equivalents and restricted cash	**$ 102,638,557**	$ 89,454,988
Supplemental disclosure of cash flow information and non-cash transactions:		
Interest paid in cash	**$ 274,562**	$ 299,056
Property and equipment included in accounts payable and accrued liabilities	**$ 10,565,820**	$ 2,926,016

See accompanying notes to the consolidated financial statements.

AquaBounty Technologies, Inc.
Notes to the Consolidated Financial Statements
for the years ended December 31, 2022 and 2021

1. Nature of business and organization

Nature of business

AquaBounty Technologies, Inc. (the "Parent" and, together with its wholly owned subsidiaries, the "Company") was incorporated in December 1991 in the State of Delaware for the purpose of conducting research and development of the commercial viability of a group of proteins commonly known as antifreeze proteins. In 1996, the Parent obtained the exclusive licensing rights for a gene construct (transgene) used to create a breed of farm-raised Atlantic salmon that exhibit growth rates that are substantially faster than conventional salmon. In 2015, the Parent obtained regulatory approval from the U.S. Food and Drug Administration for the production and sale of its genetically engineered AquAdvantage salmon product ("GE Atlantic salmon") in the United States and in 2016, the Parent obtained regulatory approval from Health Canada for the production and sale of its GE Atlantic salmon product in Canada. In 2021, the Parent obtained regulatory approval from the National Biosafety Technical Commission for the sale of its GE Atlantic salmon product in Brazil. In 2021, the Company began harvesting and selling its GE Atlantic salmon in the United States and Canada.

Basis of presentation

The consolidated financial statements include the accounts of AquaBounty Technologies, Inc. and its wholly owned subsidiaries. The entities are collectively referred to herein as the "Company." All inter-company transactions and balances have been eliminated upon consolidation.

Liquidity

The Company completed an equity raise in 2021with net proceeds of $119.1 million and has $102.6 million in cash and cash equivalents, and restricted cash as of December 31, 2022. The Company's plans include the continued construction of a 10,000 metric ton salmon farm in Ohio at a total project cost that is estimated to be between $375 million and $395 million. The Company plans to use cash-on-hand and debt financing to fund the remaining construction. While the Company has committed a significant amount of its current cash to fund a portion of the project, if necessary, management can utilize that cash for working capital purposes and therefore, management believes that it has sufficient cash to meet the Company's requirements beyond the next twelve months from the filing date of these consolidated financial statements. However, until such time as the Company reaches profitability, it will require additional financing to fund its operations and execute its business plan.

2. Summary of significant accounting policies

Use of estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities as of the date of the consolidated financial statements and the reported amounts of expenses during the reporting periods. Actual results could differ from those estimates.

Comprehensive loss

The Company displays comprehensive loss and its components as part of its consolidated financial statements. Comprehensive loss consists of net loss and other comprehensive income (loss). Other comprehensive income (loss) includes foreign currency translation adjustments and unrealized gains (losses) on the Company's marketable securities.

Foreign currency translation

The functional currency of the Parent is the US Dollar. The functional currency of the Canadian Subsidiary is the Canadian Dollar (C$) and the functional currency of the US and Brazil Subsidiaries is the US Dollar. For the Canadian Subsidiary, assets and liabilities are translated at the exchange rates in effect at the balance sheet date, equity accounts are translated at the historical exchange rate and the income statement accounts are translated at the average rate for each period during the year. Net translation gains or losses are adjusted directly to a separate component of other comprehensive income (loss) within stockholders' equity.

Cash equivalents

The Company considers all highly liquid investments with maturities of three months or less when purchased to be cash equivalents. Cash equivalents consist primarily of business savings accounts, certificates of deposit and money market accounts.

Marketable securities

Marketable securities include government bonds, corporate bonds and commercial paper. The Company's investment policy requires investments to be explicitly rated by two of Standard & Poor's, Moody's or Fitch and to have a minimum rating of A1, P1 or F-1, respectively, from those agencies. In addition, the investment policy limits individual maturities to 12 months, the dollar-weighted average maturity to 180 days and the amount of credit exposure to any one issuer to 5%.

Fair Value of Financial instruments

The Company groups its financial instruments measured at fair value, if any, in three levels based on the markets in which the instruments are traded and the reliability of the assumptions used to determine fair value. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Financial instruments with readily available quoted prices or for which fair value can be measured from actively quoted prices generally will have a higher degree of market price observability and a lesser degree of judgement used in measuring fair value. The three levels of the fair value hierarchy are as follows:

Level 1: Inputs to the valuation methodology are quoted prices, unadjusted, for identical assets or liabilities in active markets.

Level 2: Inputs to the valuation methodology include quoted prices for similar assets or liabilities in active markets; quoted prices for identical or similar assets or liabilities in markets that are not active; or inputs derived principally from, or that can be corroborated by, observable market data by correlation or other means.

Level 3: Inputs to the valuation methodology are unobservable and significant to the fair value measurement. Level 3 assets and liabilities include financial instruments whose value is determined using discounted cash flow methodologies, as well as instruments for which the determination of fair value requires significant management judgement or estimation.

The carrying amounts reported in the consolidated balance sheets for receivables, prepaid expenses and other current assets, and accounts payable approximate fair value based on the short-term maturity of these instruments. The carrying value of term debt includes market terms and interest rates. All of the Company's interest-bearing debt is at fixed rates, except for the loan with First Farmer's Bank and Trust, which has a rate reset in July 2025.

The following tables present the placement in the fair value hierarchy of financial assets that are measured at fair value on a recurring basis as of December 31, 2022 and 2021:

	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
		December 31, 2021		
Marketable securities	$ -	$ 101,773,781	$ -	$ 101,773,781
Long term equity investment	-	-	8,651	8,651
Total	$ -	$ 101,773,781	$ 8,651	$ 101,782,432

		December 31, 2022		
Marketable securities	**$ -**	**$ -**	**$ -**	**$ -**
Long term equity investment	**-**	**-**	**8,651**	**8,651**
Total	**$ -**	**$ -**	**$ 8,651**	**$ 8,651**

Inventories

Inventories are mainly comprised of feed, eggs, fry, fish in process and fish for sale. Fish in process inventory is a biological asset that is measured based on the estimated biomass of fish on hand. The Company has established a standard procedure to estimate the biomass of fish on hand using counting and sampling techniques. The Company measures inventory at the lower of cost or net realizable value (NRV), where NRV is defined as the estimated market price, less the estimated costs of processing, packaging and transportation. The Company considers fish that has been harvested and transported from its farm to be fish for sale.

Intangible assets

Definite lived intangible assets include patents and licenses. Patent costs consist primarily of legal and filing fees incurred to file patents on proprietary technology developed by the Company. Patent costs are amortized on a straight-line basis over 20 years beginning with the filing date of the applicable patent. License fees are capitalized and expensed over the term of the licensing agreement.

Indefinite lived intangible assets include trademark costs, which are capitalized with no amortization as they have an indefinite life.

Property, plant and equipment

Property, plant and equipment are recorded at cost. The Company depreciates all asset classes over their estimated useful lives, as follows:

Building	20 - 25 years
Equipment	5 - 20 years
Office furniture and equipment	3 years
Leasehold improvements	shorter of asset life or lease term
Vehicles	3 years

The Company commences depreciation on an asset when it is placed into service.

Impairment of long-lived assets

The Company reviews the carrying value of its long-lived assets, definite lived intangible assets, and property, plant and equipment when facts and circumstances suggest that they may be impaired. The carrying values of such assets are considered impaired when the estimated undiscounted cash flows from such assets are less than their carrying values. An impairment loss, if any, is recognized in the amount of the difference between the carrying amount and the fair value of such assets.

Indefinite lived intangible assets are subject to impairment testing annually or more frequently if impairment indicators arise. The Company's impairment testing utilizes a discounted cash flow analysis that requires significant management judgment with respect to revenue and expense growth rates, changes in working capital and the selection and use of the appropriate discount rate. An impairment loss is recognized in the amount of the difference between the carrying amount and fair value.

Leases

The Company leases certain facilities, property, and equipment under noncancelable operating leases. A determination is made if an arrangement is a lease at its inception, and leases with an initial term of twelve months or less are not recorded on the balance sheet. Lease terms may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option. For operating leases, expense is recognized on a straight-line basis over the lease term. The Company has agreements with lease (e.g., minimum rent payments) and non-lease components (e.g., maintenance), which are generally accounted for separately. The Company has not elected the practical expedient to account for lease and non-lease components as one lease component.

Revenue recognition

The Company is comprised of one reporting segment and generates revenue from the sale of its products. Revenue is recognized when the customer takes physical control of the goods, in an amount that reflects the transaction price consideration that the Company expects to receive in exchange for the goods. Revenue excludes any sales tax collected and includes any estimate of future credits.

During the years ended December 31, 2022 and 2021, the Company recognized the following product revenue:

	Year Ended December 31, 2021		
	U.S.	Canada	Total
GE Atlantic salmon	$ 427,615	$ 355,391	$ 783,006
Non-GE Atlantic salmon eggs	-	194,028	194,028
Non-GE Atlantic salmon fry		196,582	196,582
Other revenue	-	1,216	1,216
Total Revenue	$ 427,615	$ 747,217	$ 1,174,832

	Year Ended December 31, 2022		
	U.S.	Canada	Total
GE Atlantic salmon	$ 2,518,495	$ 394,478	$ 2,912,973
Non-GE Atlantic salmon eggs	-	85,089	85,089
Non-GE Atlantic salmon fry	-	102,387	102,387
Other revenue	-	36,505	36,505
Total Revenue	$ 2,518,495	$ 618,459	$ 3,136,954

During the years ended December 31, 2022 and 2021, the Company had the following customer concentration of revenue:

	Year Ended December 31,	
	2022	2021
Customer A	**36%**	30%
Customer B	**17%**	27%
Customer C	**15%**	21%
All other	**32%**	22%
Total of all customers	**100%**	100%

Income taxes

The Company uses the liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are recorded for the expected future tax consequences of temporary differences between the financial reporting and income tax bases of assets and liabilities and are measured using the enacted tax rates and laws that are expected to be in effect when the differences reverse. A valuation allowance is established to reduce net deferred tax assets to the amount expected to be realized. The Company follows accounting guidance regarding the recognition, measurement, presentation and disclosure of uncertain tax positions in the financial statements. Tax positions taken or expected to be taken in the course of preparing the Company's tax returns are required to be evaluated to determine whether the tax positions are "more likely than not" to be upheld under regulatory review. The resulting tax impact of these tax positions is recognized in the financial statements based on the results of this evaluation. The Company did not recognize any tax liabilities associated with uncertain tax positions, nor has it recognized any interest or penalties related to unrecognized tax positions. The Company is not currently under exam and is no longer subject to federal and state tax examinations by tax authorities for years before 2019.

Net loss per share

Basic and diluted net loss per share available to common stockholders has been calculated by dividing net loss by the weighted average number of common shares outstanding during the year. Basic net loss per share is based solely on the number of common shares outstanding during the year. Fully diluted net loss per share includes the number of shares of common stock issuable upon the exercise of warrants and options with an exercise price less than the fair value of the common stock. Since the Company is reporting a net loss for all periods presented, all potential common shares are considered anti-dilutive and are excluded from the calculation of diluted net loss per share.

The following potentially dilutive securities have been excluded from the calculation of diluted net loss per share, as their effect is anti-dilutive:

	Year Ended December 31,	
Weighted Average Outstanding	2022	2021
Stock options	**816,602**	670,111
Warrants	**418,441**	532,380
Unvested restricted shares	**166,261**	68,981

Share-based compensation

The Company measures and recognizes all share-based payment awards, including stock options and restricted share units made to employees and Directors, based on estimated fair values. The fair value of a share-based payment award is estimated on the date of grant using an option pricing model. The value of the portion of the award that is ultimately expected to vest is recognized as an expense over the requisite service period in the Company's consolidated statement of operations. The Company uses the

Black-Scholes option pricing model ("Black-Scholes") as its method of valuation. Non-employee stock-based compensation is accounted for using Black-Scholes to determine the fair value of warrants or options awarded to non-employees with the fair value of such issuances expensed over the period of service.

Recently Issued Accounting Standards

Management does not expect any recently issued, but not yet effective, accounting standards to have a material effect on its results of operations or financial condition.

3. Risks and uncertainties

The Company is subject to risks and uncertainties common in the biotechnology and aquaculture industries. Such risks and uncertainties include, but are not limited to: (i) results from current and planned product development studies and trials; (ii) decisions made by the FDA or similar regulatory bodies in other countries with respect to approval and commercial sale of any of the Company's proposed products; (iii) the commercial acceptance of any products approved for sale and the Company's ability to produce, distribute, and sell for a profit any products approved for sale; (iv) the Company's ability to obtain the necessary patents and proprietary rights to effectively protect its technologies; and (v) the outcome of any collaborations or alliances entered into by the Company.

Concentration of credit risk

Financial instruments that potentially subject the Company to credit risk consist principally of cash, cash equivalents, and marketable securities. This risk is mitigated by the Company's policy of maintaining all balances with highly rated financial institutions, investing cash equivalents with maturities of less than 90 days, and investing marketable securities with maturities of less than 180 days. The Company's cash balances may at times exceed insurance limitations. The Company holds cash balances in bank accounts located in Canada to fund its local operations. These amounts are subject to foreign currency exchange risk, which is minimized by the Company's policy to limit the balances held in these accounts. Balances in Canadian bank accounts at December 31, 2022 and 2021 totaled $518 thousand and $224 thousand, respectively. The Company also holds cash equivalent investments in a highly liquid investment account at a major financial institution. As of December 31, 2022 and 2021 the cash equivalent investment balance was $10.6 million and $73.3 million, respectively.

4. Marketable Securities

Marketable securities are classified as available-for-sale. The following table summarizes the amortized cost, gross unrealized gains and losses, and the fair value as of December 31, 2021. The Company had no marketable securities as of December 31, 2022 The balance of unrealized losses at December 31, 2021 were recognized during 2022.

	Amortized Cost	Unrealized Gains	Unrealized Losses	Market Value
	December 31, 2021			
Government bonds	$ 28,453,161	$ 82	$ (18,255)	$ 28,434,988
Corporate bonds	29,874,696	-	(21,928)	29,852,768
Commercial paper	43,486,025	-	-	43,486,025
Marketable securities	$ 101,813,882	$ 82	$ (40,183)	$ 101,773,781

5. Inventory

Major classifications of inventory are summarized as follows for December 31, 2022 and 2021:

	December 31, 2022	December 31, 2021
Feed	**$ 366,957**	162,047
Eggs and fry	**22,140**	—
Fish in process	**1,869,387**	926,360
Fish for sale	**18,108**	171,503
Inventory	**$ 2,276,592**	1,259,910

6. Property, plant and equipment

Major classifications of property, plant and equipment are summarized as follows for December 31, 2022 and 2021:

	December 31, 2022	December 31, 2021
Land	**$ 2,968,561**	$ 725,799
Building and improvements	**15,535,904**	15,580,385
Construction in process	**78,806,762**	8,119,575
Equipment	**17,259,301**	15,981,408
Office furniture and equipment	**258,972**	240,939
Vehicles	**106,074**	36,280
Total property and equipment	**$ 114,935,574**	$ 40,684,386
Less accumulated depreciation and amortization	**(8,649,388)**	(6,869,267)
Property, plant and equipment, net	**$ 106,286,186**	$ 33,815,119

Depreciation and amortization expense for 2022 and 2021 on property, plant and equipment was $2.0 million and $1.8 million, respectively.

As of December 31, 2022, construction in process included $75.5 million, $2.7 million and $590 thousand for construction related to the Ohio, Rollo Bay and Indiana farm sites, respectively. An additional $29.2 million has been contractually committed for these farm sites as of December 31, 2022.

7. Debt

The current terms and conditions of long-term debt outstanding as of December 31, 2022 and 2021, are as follows:

	Interest rate	Monthly repayment	Maturity date	December 31, 2022	December 31, 2021
ACOA AIF Grant	0%	Royalties	-	**$ 2,119,476**	$ 2,261,349
ACOA term loan #1	0%	C$3,120	Feb 2027	**115,158**	152,346
ACOA term loan #2	0%	C$4,630	Sep 2029	**276,743**	339,015
ACOA term loan #3	0%	C$6,945	Dec 2025	**184,500**	196,850
Kubota Canada Ltd	0%	C$1,142	Jan 2025	**21,077**	33,283
DFO term loan	0%	C$16,865	Jan 2034	**854,885**	405,700
Finance PEI term loan	4%	C$16,313	Nov 2023	**1,752,547**	1,947,510
First Farmers Bank & Trust term loan	5.375%	$56,832	Oct 2028	**3,401,019**	3,883,325
Total debt				**$ 8,725,405**	$ 9,219,378
less: debt issuance costs				**(52,065)**	(68,680)
less: current portion				**(2,387,231)**	(627,365)
Long-term debt, net				**$ 6,286,109**	$ 8,523,333

Principal payments due on the long-term debt are as follows:

	Total
2023	$ 2,402,059
2024	715,026
2025	788,688
2026	758,079
2027	768,580
Thereafter	3,292,973
Total	$ 8,725,405

Atlantic Canada Opportunities Agency ("ACOA")

ACOA is a Canadian government agency that provides funding to support the development of businesses and promote employment in the Atlantic region of Canada.

ACOA Atlantic Innovation Fund ("AIF") Grant

In January 2009, the Canadian Subsidiary was awarded an AIF grant from ACOA to provide a contribution towards the funding of a research and development project. Contributions under the grant were made through 2014 and no further funds are available. Amounts claimed by the Canadian Subsidiary must be repaid in the form of a 10% royalty on any products that are commercialized out of this research project until the loan is fully repaid. Revenue from the sale of the Company's GE Atlantic salmon is not subject to the royalty, and the Company does not expect to commercialize products that would be subject to the royalty in the next five years.

ACOA term loans

In February 2016, the Canadian Subsidiary executed an agreement with ACOA to partially finance the renovations to the Rollo Bay farm site. All available funding under the agreement was disbursed through May 2017, and no further amounts are available. The loan is being repaid over a 108-month term at a zero percent interest rate.

In November 2018, the Canadian Subsidiary executed a second agreement with ACOA to partially finance the renovations to the Rollo Bay site. All available funding under the agreement was disbursed through March 2019, and no further amounts are available. The loan is being repaid over a 108-month term with a zero percent interest rate.

In July 2021, the Canadian Subsidiary entered into a contribution agreement with ACOA under its REGI-Business Scale-up and Productivity program to provide funding assistance for the Rollo Bay farm site, and on August 20, 2021, the Canadian Subsidiary received C$250,000 ($200,075). All funds received are to be repaid over a 36-month term commencing January 2023 at a zero percent interest rate.

Kubota

In January 2018, the Canadian Subsidiary financed the purchase of equipment through a loan with Kubota. The total amount is being repaid in monthly installments. The loan is secured by the underlying equipment.

Finance PEI ("FPEI")

FPEI is a corporation of the Ministry of Economic Development and Tourism for Prince Edward Island, Canada, and administers business financing programs for the provincial government.

In August 2016, the Canadian Subsidiary obtained a loan from FPEI to partially finance the purchase of the assets of the former Atlantic Sea Smolt plant in Rollo Bay West on Prince Edward Island.

In 2018, the Canadian Subsidiary obtained a new loan from FPEI, which incorporated the existing loan and provided C$2.0 million ($1.5 million) of additional funds. All funds have been dispersed and the loan is being repaid over an 87-month term ending in November 2023. The loan has an interest rate of 4% and is collateralized by a mortgage executed by the Canadian Subsidiary, which conveys a first security interest in all of its current and acquired assets. A balloon payment for the loan is due in November 2023. The loan is guaranteed by the Parent.

First Farmers Bank & Trust ("FFBT")

On July 31, 2020, the Company's Indiana Subsidiary obtained a $4.0 million loan from First Farmers Bank and Trust. Net proceeds were $3.9 million after deducting $90 thousand in loan costs. The loan bears interest at a rate of 5.375% for the first five years. On July 31, 2025, the interest rate resets to the then U.S. Treasury 5-year maturities rate plus 5% and remains fixed at that rate through maturity on October 1, 2028. The note required interest only payments for the first 13 months, followed by monthly principal and interest payments of approximately $57 thousand through maturity. Proceeds from the loan may be used for the purpose of performing equipment upgrades, purchasing equipment and other improvements to the Indiana farm. The Company must comply with certain financial and non-financial covenants and provide certification of compliance quarterly. At December 31, 2022, the Company was in compliance with such covenants. The loan is also subject to certain prepayment penalties and is secured by the assets of the Indiana subsidiary and a guarantee by the Parent. The loan agreement requires the Company to maintain a minimum cash balance with the bank throughout the loan term. This amount is reflected as restricted cash on the balance sheet.

On October 12, 2021, the Company and FFBT agreed to a modification to the terms of its outstanding loan. The new terms delay the start date of certain of the loan's negative covenants to the quarter commencing on October 1, 2022 and raises the required restricted

cash balance amount from $500 thousand to $1.0 million. On December 13, 2022, FFBT removed two of the loan's negative covenants.

Department of Fisheries and Oceans ("DFO")

DFO is a department of the government of Canada responsible for safeguarding its waters and managing its fisheries, oceans and freshwater resources. DFO supports economic growth in the marine and fisheries sectors, and innovation in areas such as aquaculture and biotechnology.

In September 2020, the Canadian Subsidiary entered into a Contribution Agreement with DFO's Atlantic Fisheries Fund, whereby it is eligible to receive up to C$1.9 million ($1.4 million) to finance new equipment for its Rollo Bay farm (the "DFO Term Loan"). On February 25, 2021, the Canadian Subsidiary borrowed C$238,400 ($187,120) and on April 27, 2021 the Canadian Subsidiary borrowed C$276,840 ($219,258) under the DFO Term Loan. On April 7, 2022, the Canadian Subsidiary borrowed C$53,456 ($42,338) and on December 1, 2022 the Canadian Subsidiary borrowed C$589,684 ($433,890) under the DFO Term Loan. Borrowings are interest free and monthly repayments commence in August 2024, with maturity in January 2034.

The Company recognized interest expense of $291 thousand and $316 thousand for the years ended December 31, 2022 and 2021, respectively, on its interest-bearing debt.

8. Stockholders' equity

The Company's shareholders have authorized 155 million shares of stock, of which 5 million are authorized as preferred stock and 150 million as common stock. As of December 31, 2022 and 2021, the Company had zero shares of preferred stock and 71,110,713 shares and 71,025,738 shares of common stock, issued and outstanding, respectively.

Common stock

The holders of the common stock are entitled to one vote for each share held at all meetings of stockholders. Dividends and distribution of assets of the Company in the event of liquidation are subject to the preferential rights of any outstanding preferred shares.

Recent issuances

During 2021, the Company completed a public offering of 14,950,000 shares of common stock for net proceeds of approximately $119.1 million.

Warrants

As of December 31, 2022 and 2021, 418,441 warrants to purchase common stock were outstanding. All outstanding warrants had an expiration date of January 17, 2023.

Share-based compensation

In 2006, the Company established the 2006 Equity Incentive Plan (the "2006 Plan"). The 2006 Plan provided for the issuance of incentive stock options to employees of the Company and non-qualified stock options and awards of restricted stock to Directors, officers, employees, and consultants of the Company. In accordance with its original terms, the 2006 Plan terminated on March 18, 2016. All outstanding awards under the 2006 Plan will continue until their individual termination dates.

In March 2016, the Company's Board of Directors adopted the AquaBounty Technologies, Inc. 2016 Equity Incentive Plan (the "2016 Plan") to replace the 2006 Plan. The 2016 Plan provides for the issuance of incentive stock options, non-qualified stock options, and awards of restricted and direct stock purchases to Directors, officers, employees, and consultants of the Company. Total common shares authorized under the 2016 Plan are 1,900,000, of which 452,620 shares are reserved for future issuance as of December 31, 2022.

Restricted stock

The Company's restricted stock activity under the 2016 Plan is summarized as follows:

	Shares	Weighted average grant date fair value
Unvested at December 31, 2021	65,100	$ 4.10
Granted	265,088	1.51
Vested	(128,979)	2.27
Forfeited	(1,755)	1.52
Unvested at December 31, 2022	199,454	$ 1.86

During 2022 and 2021, the Company expensed $358 thousand and $240 thousand, respectively related to restricted stock awards. At December 31, 2022, the balance of unearned share-based compensation to be expensed in future periods related to the restricted stock awards is $187 thousand. The period over which the unearned share-based compensation is expected to be earned is approximately 2.3 years.

Stock options

The Company's option activity under the 2006 Plan and the 2016 Plan is summarized as follows:

	Number of options	Weighted average exercise price
Outstanding at December 31, 2021	663,425	$ 4.31
Issued	214,755	1.55
Exercised	(1,012)	1.52
Forfeited	(8,020)	1.52
Expired	(29,038)	5.82
Outstanding at December 31, 2022	840,110	$ 3.58
Exercisable at December 31, 2022	678,634	$ 3.97

Options issued to employees, members of the Board of Directors, and non-employees generally vest over a period of one year to three years and are exercisable for a term of ten years from the date of issuance.

The weighted average fair value of stock options granted during 2022 was $1.11 (2021: $5.36). There were 1,012 options exercised in 2022 (2021: 16,667). The total intrinsic value of options exercised in 2022 was $142 (2021: $41 thousand). As of December 31, 2022, the total intrinsic value of all options outstanding was $0 (2021: $18 thousand) and the total intrinsic value of exercisable options was $0 (2021: $11 thousand).

The following table summarizes information about options outstanding and exercisable as of December 31, 2022:

Weighted average exercise price of outstanding options	Number of options outstanding	Weighted average remaining estimated life (in years)	Number of options exercisable
$1.49 - $2.50	715,985	7.1	567,130
$5.44 - $6.72	45,235	7.6	32,614
$7.50 - $10.80	12,303	1.0	12,303
$14.20 - $23.40	66,587	3.2	66,587
	840,110		678,634

The fair values of stock option grants to employees and members of the Board of Directors during 2022 and 2021 were measured on the date of grant using Black-Scholes, with the following weighted average assumptions:

	2022
Expected volatility	**92% - 103%**
Risk free interest rate	**1.71% - 3.95%**
Expected dividend yield	**0.0%**
Expected life (in years)	**5**

The risk-free interest rate is estimated using the Federal Funds interest rate for a period that is commensurate with the expected term of the awards. The expected dividend yield is zero because the Company has never paid a dividend and does not expect to do so for the foreseeable future. The expected life was based on a number of factors including historical experience, vesting provisions, exercise price relative to market price, and expected volatility. The Company believes that all groups of employees demonstrate similar exercise and post-vesting termination behavior and, therefore, does not stratify employees into multiple groups and forfeitures are recognized as they occur. The expected volatility was estimated using the Company's historical price volatility over a period that is commensurate with the expected term of the awards.

Total share-based compensation on stock-option grants amounted to $177 thousand and $154 thousand for the years ended December 31, 2022 and 2021, respectively. As of December 31, 2022, the balance of unearned share-based compensation to be expensed in future periods related to unvested share-based awards is $233 thousand. The period over which the unearned share-based compensation is expected to be earned is 2.4 years.

Share-based compensation

The following table summarizes share-based compensation costs recognized in the Company's Consolidated Statements of Operations and Comprehensive Loss for the years ended December 31, 2022 and 2021:

		2022		2021
Sales and marketing		**15,956**		-
General and administrative		**519,167**		394,237
Total share-based compensation	**$**	**535,123**	$	394,237

9. Income taxes

The components of loss before income taxes for the years ended December 31, 2022 and 2021 are presented below:

		2022		2021
Domestic	**$**	**(20,673,855)**	$	(21,105,065)
Foreign		**(1,483,340)**		(1,217,523)
Loss before income taxes	**$**	**(22,157,195)**	$	(22,322,588)

We have made no provision for foreign or domestic income taxes on the cumulative unremitted earnings of our foreign subsidiaries. We intend to permanently reinvest all foreign earnings and have no intention to repatriate foreign earnings for the foreseeable future.

Income taxes computed using the federal statutory income tax rate differs from the Company's effective tax rate for the years ended December 31, 2022 and 2021 primarily due to the following:

		2022		2021
Income tax benefit	**$**	**(4,653,011)**	$	(4,687,744)
State and provincial income tax, net of federal benefit		**(1,031,963)**		(1,157,840)
Permanent differences		**(60,904)**		202,583
US-Foreign rate differential		**(65,058)**		39,045
Other, net		**483,873**		(299,071)
	$	**(5,327,063)**	$	(5,903,027)
Change in valuation allowance		**5,327,063**		5,903,027
Total income tax	**$**	**-**	$	-

As of December 31, 2022, the Company has domestic net operating loss carryforwards of approximately $97 million, after consideration of limitations pursuant to section 382, to offset future federal taxable income, which begin to expire in 2033. As of December 31, 2022, the Company has domestic net operating loss carryforwards of approximately $69 million, which can be carried forward indefinitely. The future utilization of certain historic net operating loss and tax credit carryforwards, however, is subject to annual use limitations based on the change in stock ownership rules of Internal Revenue Code Sections 382 and 383. The Company experienced a change in ownership under these rules during 2012 and revised its calculation of net operating loss carryforwards based on annual limitation rules. The Company also has foreign research and development loss carryforwards totaling approximately $12 million and foreign research and development expense tax credits of approximately $2 million as of December 31, 2022, which expire at various times commencing in 2023. Since the Company has incurred only losses from inception and there is uncertainty related to the ultimate use of the loss carryforwards and tax credits, a valuation allowance has been recognized to offset the Company's deferred tax assets, and no benefit for income taxes has been recorded.

The IRS recently released guidance which modifies the procedures for taxpayers that incur specified research or experimental (R&E) expenditures to change their method of accounting to comply with the new capitalization and amortization rules provided in Section 174, as revised by the Tax Cuts and Jobs Act. The new Section 174 rules require taxpayers to capitalize and amortize specified R&E expenditures over a period of five years (for domestic research) or 15 years (for foreign research), beginning with the midpoint of the taxable year in which the expenses are paid or incurred. The impact will be to defer the tax benefit of R&E expenditures.

Significant components of the Company's deferred tax assets and liabilities are as follows:

		2022		2021
Deferred tax assets:				
Net operating loss carryforwards	**$**	**28,188,265**	$	23,216,863
Foreign research and development tax credit carryforwards		**2,454,756**		2,428,663
Property and equipment		**(249,382)**		145,530
Intangibles and other		**3,658,921**		2,934,441
Total deferred tax assets	**$**	**34,052,560**	$	28,725,497
Valuation allowance		**(34,052,560)**		(28,725,497)
Net deferred tax assets	**$**	**-**	$	-

10. Commitments and contingencies

The Company recognizes and discloses commitments when it enters into executed contractual obligations with other parties. The Company accrues contingent liabilities when it is probable that future expenditures will be made and such expenditures can be reasonably estimated.

The Company is subject to legal proceedings and claims arising in the normal course of business. Management believes that final disposition of any such matters existing at December 31, 2022, will not have a material adverse effect on the Company's financial position or results of operations.

Lease commitments

Lease expense for the years ended December 31, 2022 and 2021, amounted to $86 thousand and $84 thousand, respectively. As of December 31, 2022, the weighted average remaining lease term of the Company's operating leases was 26 years. Lease payments included in operating cash flows totaled $84 thousand and $84 thousand for the years ended December 31, 2022 and 2021, respectively.

The table below summarizes the Company's lease obligations as of December 31, 2022 and 2021:

		Lease Liability at December 31,		
		2022		**2021**
Total leases	**$**	**224,058**	$	290,327
Less: current portion		**(20,831)**		(66,269)
Long-term leases	**$**	**203,227**	$	224,058

The Company used a weighted average discount rate of 8% in calculating the net present value of the future lease payments. The current portion of the lease liability is included as a component of other current liabilities in the consolidated balance sheets.

Remaining payments under leases are as follows as of December 31, 2022:

Year		Amount
2023	$	33,873
2024		17,481
2025		18,006
2026		18,546
2027		19,102
Thereafter		564,225
Total lease payments		671,233
Less: imputed interest		(447,175)
Total operational lease liabilities	$	224,058

11. Retirement plan

The Company has a savings and retirement plan for its US employees that qualifies under Section 401(k) of the Internal Revenue Code. The plan covers substantially all employees and provides for voluntary contributions by participating employees up to the maximum contribution allowed under the Internal Revenue Code. Contributions by the Company can be made, as determined by the Board of Directors, provided the amount does not exceed the maximum permitted by the Internal Revenue Code. Company contributions made and expensed in operations in connection with the plan during the years ended December 31, 2022 and 2021, amounted to $94 thousand and $81 thousand, respectively.

The Company also has a Registered Retirement Savings Plan for its Canadian employees. Company contributions made and expensed in operations in connection with the plan during the years ended December 31, 2022 and 2021, amounted to $44 thousand and $38 thousand, respectively.

12. Related Party Agreement

Letter Agreement with Third Security

On July 30, 2021, the Company entered into an agreement with TS Aquaculture LLC and certain of its affiliates (“TS Aquaculture”) that required the Company to file a registration statement to register the Company’s shares held by TS Aquaculture. The registration statement was filed on August 5, 2021 and TS Aquaculture completed a transaction to sell 12,880,000 shares of common stock of the Company on November 23, 2021. TS Aquaculture ceased being a related party after completing the sale. TS Aquaculture agreed to pay all expenses incurred in connection with these transactions, which totaled $418 thousand and is included in prepaid and other current assets in the consolidated financial statements as of December 31, 2021. The receivable balance was received in full from TS Aquaculture in 2022.