



Advanced Emissions Solutions, Inc.

Advancing **Cleaner** Energy

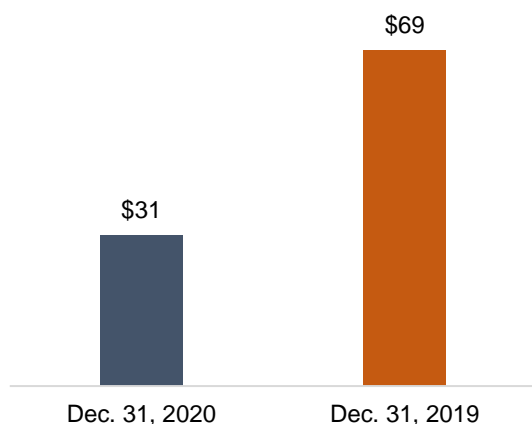
2020

Annual Report

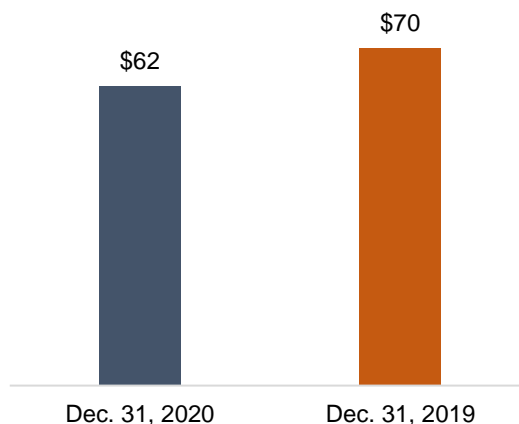
2020 Financial Highlights

(\$ in millions, 12-months ended)

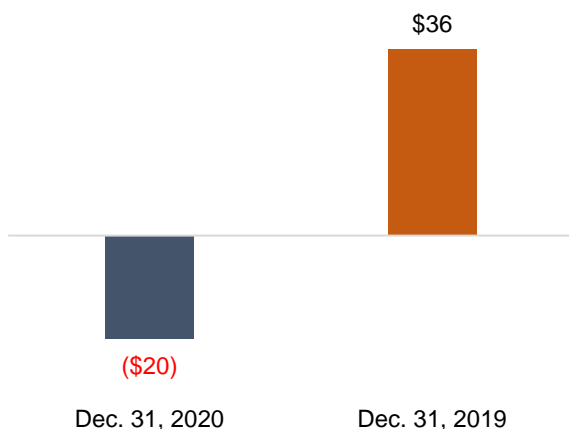
Equity Method Earnings



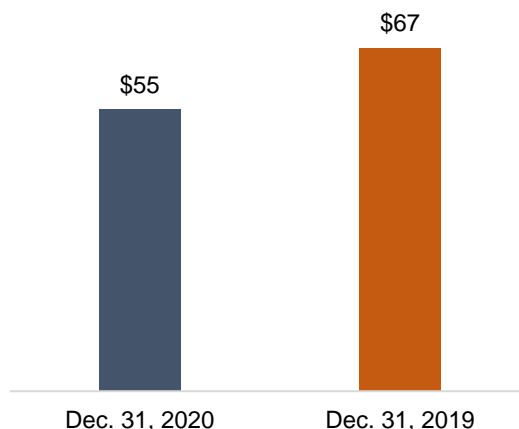
Total Revenue



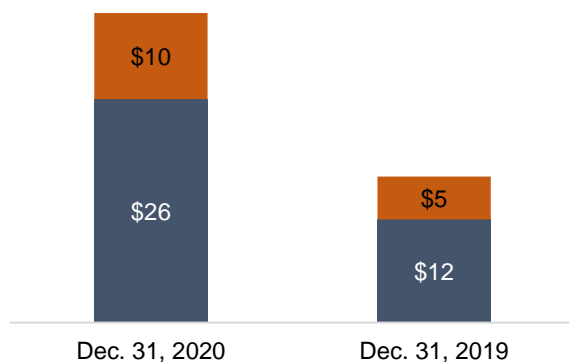
Net Income (Loss)



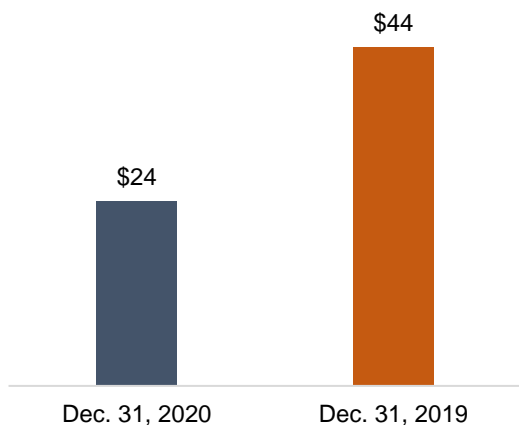
Adjusted EBITDA⁽¹⁾



Cash, Equivalents & Restricted



Current & Long-Term Debt



■ Cash & Equivalents ■ Restricted Cash

(1) Adjusted EBITDA is a non-GAAP measure. Please reference the reconciliations in our Form 10-K.

Advanced Emissions Solutions Companies

Advanced Emissions Solutions, Inc. (“ADES”) provides solutions to customers in coal-fired power generation and industrials, municipal water and other industries through the proprietary emissions control and water purification technologies of our subsidiaries and joint ventures. Our proprietary technologies and associated product offerings provide pollutant control solutions to enable coal-fired power generators and industrials as well as municipal water to meet applicable regulations.

Our primary brand, ADA, brings together ADA Carbon Solutions, LLC, a leading provider of powder activated carbon and ADA-ES, Inc., the providers of ADA® M-Prove™ Technology and other mercury control technologies. We provide products and services to control mercury and other contaminants at coal-fired power generators and other industrial companies. Our broad suite of complementary products control contaminants and help our customers meet their compliance objectives consistently and reliably.

ADES subsidiaries produce and deliver many of our products through three key assets:

1. The Red River Plant, which is the largest, most automated and environmentally friendly activated carbon plant in North America;
2. The Natchitoches Processing Facility provides custom processing and packaging; and
3. The Five Forks Mine supports our vertical integration by providing a dedicated source for raw materials.

CarbPure Technologies LLC (“CarbPure”), formed in 2015, provides high-quality powdered activated carbon (“PAC”) and granular activated carbon (“GAC”) ideally suited for treatment of potable water and wastewater. Our affiliate company, ADA Carbon Solutions (Red River), LLC, manufactures products for CarbPure.

Tinum Group, LLC (“Tinum Group”) is a 42.5% owned joint venture by ADA that provides patented Refined Coal (“RC”) technologies to enhance combustion of and reduce emissions of NOx and mercury from coal-fired power plants.



Dear Fellow Shareholders,

In 2020, amidst a global pandemic, we took bold steps toward becoming the emissions control products and technology company we aim to be: the provider of choice for activated carbon products for a diverse collection of industry applications and markets.

We are incredibly proud of our entire team and their selfless commitment to the Company and our customers during a year that tested us all. We entered 2021 with encouraging momentum across our business that continues to validate our post-Refined Coal strategy.

2020: Diversify & Grow

One year ago, we outlined our three key priorities for 2020 as we prepared for the cessation of our Refined Coal (“RC”) business. They were as follows:

- Continue to increase and protect our net RC cash flows to facilitate our capital allocation program, including the investment in our activated carbon businesses.
- Leverage the Red River plant’s utilization and low-cost advantages by filling the plant’s volume capacity with incremental wins in new and growing market opportunities, diversifying our product portfolio away from coal-based applications and remaining vigilant for additional opportunities upon expected market rationalization.
- And finally, we reiterated our commitment to opportunistically returning capital to our shareholders while paying down our senior term loan and strategically investing in our activated carbon business.

Unfortunately, the unprecedented conditions brought about by the global pandemic precluded us from continuing our shareholder return initiatives. In April, we made the difficult decision to suspend the dividend program and pause opportunistic share repurchases when it became clear that we needed to ensure our near-term liquidity and continuous manufacturing operations. As such, we prioritized cost containment, debt reduction and preserving the health of our balance sheet while ensuring we met customer needs. As a result, we are pleased to say that we did not experience any significant business or manufacturing interruptions during 2020.

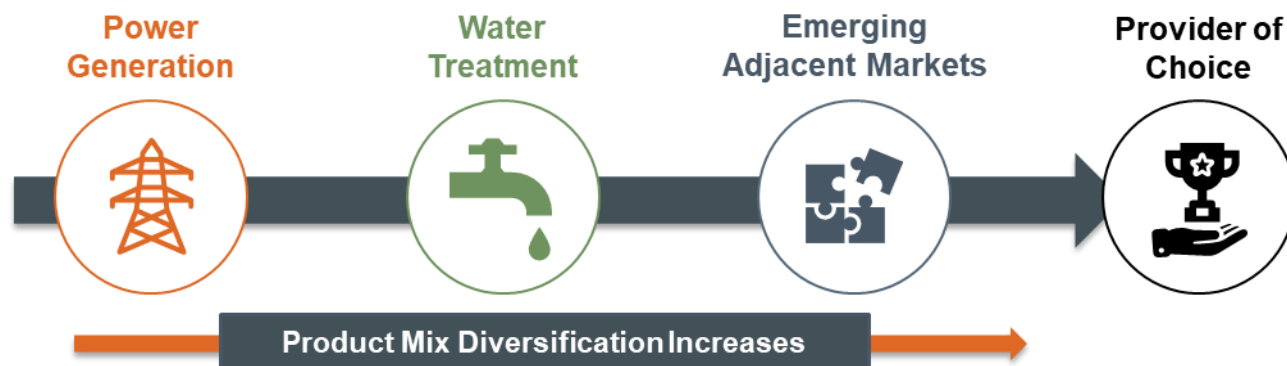
During the year, we restricted corporate travel and limited backfilling open positions, in addition to implementing rigorous safety protocols. We also reduced our term loan balance to \$16 million dollars as of the end of 2020 and we expect to pay off the remaining balance before the fourth quarter 2021 maturity. We remain focused on cost containment and will continue to evaluate our go-forward cost structure relative to business activities. All of these efforts helped us to strengthen our balance sheet in 2020. Our year-end cash balances, including restricted cash, total \$35.9 million, an increase of \$18.9 million from the prior year.

The decline in overall economic activity and subsequent decline in aggregate electrical generation, as well as the prevalence of alternative fuel sources, impacted our financial results in both our Refined Coal business as well as our activated carbon business in 2020. However, we were able to largely offset this pressure within our activated carbon business as we diversified our product mix away from coal-fired power generation with the success we have had in industrial and water markets.

Following the success of our diversification efforts, we have rebranded the segment to better reflect its long-term positioning and more expansive scope. What we previously called Power Generation and Industrials, or “PGI”, has now been renamed to Advanced Purification Technologies, or “APT” for short. The new name captures our expectations of the broader markets our solutions will serve, relative to the narrower focus at the time we acquired Carbon Solutions.

For all the disruption the pandemic caused around the globe in 2020, it did not prevent us from making the important strategic steps to strengthen our core business and improve our APT segment. Throughout 2020, Tinuum was able to secure tax-equity investors for four additional facility transactions to maximize the after-tax cash flows we receive from our RC segment. These cash flows support the organic investment in our activated carbon business as well as our deleveraging priorities. Within APT, in addition to the diversification of our product

and end-market mix, we made critically important commitments with the signing of key partnerships with Cabot Corporation to facilitate the segment's future growth.



In September, we announced that we entered into a 15-year agreement to supply Cabot with lignite activated carbon products, including powdered activated carbon (“PAC”) and granular activated carbon (“GAC”). This agreement has allowed us to secure material volume growth and better capture the low-cost manufacturing capabilities of our Red River plant. It also expands the end markets we service and will allow us to enter and deepen our presence in markets such as food and beverage, pharmaceuticals, other liquid and gas purification applications, as well as other GAC markets. This deal is a testament to the quality of the activated carbon assets we possess and is an example of the opportunities available to us to grow and scale this business.

Our APT segment maintains high renewal rates with our existing customers and is experiencing significant growth driven by the Cabot agreement. As we have discussed since our acquisition of Carbon Solutions in December 2018, our main focus has been filling the plant's capacity. Having achieved a capacity utilization level more aligned with our longer-term run rate, we are now beginning to pivot to a broader focus of moving into customer and product markets that command a higher premium. In addition to identifying new, higher margin market opportunities, we will continue to explore margin-accretive volume opportunities which will enhance the margin and earnings profile of the segment over time. We have now beaten our internal volume forecasts in consecutive quarters and are turning to optimizing our current product mix to enhance the earnings profile of the segment.

We began supplying Cabot with activated carbon products on October 1st, and our APT segment has already begun to see the positive financial impacts. The early results of our strategic efforts to fill the plant were evident in our performance during the fourth quarter of 2020 as we exceeded our segment performance in the prior year and carried that business momentum into 2021. Ultimately, over the longer-term, as a result of this agreement, we expect to see:

- Incremental annual revenue growth of 30% - 40%;
- Incremental annual EBITDA growth of \$10 million to \$15 million; and
- A reduction of our power generation exposure to less than 50% of our product portfolio.

Clearly, we are carrying encouraging business momentum into 2021. We are confident that we are solidifying our competitive position and demonstrating the industry-leading nature of our assets. We excited to build upon this progress in 2021 to ensure we are creating value for all of our stakeholders.

2021: Seizing our Opportunities

We started 2021 on a strong note, as on February 4th, we announced our second supply agreement with Cabot – this one with their EMEA subsidiary. With this agreement, we have the opportunity to provide Cabot with lignite activated carbon products and other ADES proprietary products used for mercury removal in utility and industrial coal-fired power plants in Europe, Turkey, the Middle East and Africa. This agreement is separate and incremental to the 15-Year Supply Agreement we announced with Cabot in September. As mercury and other pollutant control regulations are coming online in the European Union in 2021 and beyond, it is still too early to quantify the exact economic impact of the EMEA agreement. However, the growing sophistication of these

regulations in international markets creates a vital need for solutions like ours to ensure that industries are abiding by these new mandates. We expect to gain a clearer understanding of the financial impact as those regulations begin to be implemented this year. We are fortunate to have an established and committed business partner in Cabot going forward.

The agreements are great examples of some of the rationalization we have discussed and expect to continue to see in the activated carbon space. We continue to believe that additional opportunities will present themselves and that we stand well-positioned to be a participant given the sophistication and flexibility offered by our Red River plant. They are also a testament to the Red River plant's competitive position in the market, as well as the opportunity we see for our product solutions going forward.

In addition to the diversification offered by the agreements, we are simultaneously continuing to bid in non-power generation markets. As of today, our business and product portfolio mix remain more closely tied to power than we ultimately would like it to be. That market remains challenged by alternative fuel sources and the impact of the pandemic to aggregate power demand, but we have spent considerable time and effort organically building out our product capabilities and internal sales infrastructure. As a result, we are seeing our offering grow increasingly competitive in non-power generation markets like Industrials and Municipal Water. We have now more than doubled our water related volumes on an annualized basis. The addition of new applications, products and customers will provide us better balance in the segment and will improve our margins as we scale the business over time.

Finally, as it relates to our RC segment, this year, absent an unexpected modification to the tax credit period, will be our last year of collecting the net, after-tax cash flows from our joint venture with Tinuum Group. Based on the 23 invested facilities as of the end of 2020, we expect these after-tax RC cash flows to ADES to be between \$70 million and \$90 million. We do not expect any additional tax-equity investments, and as a result, we and Tinuum are taking the necessary steps to protect our forecasted cash flows while ensuring our internal resources are aligned with the gradual wind-down of this business.

“As the world’s need for sophisticated pollution control solutions grows, we expect to be a provider-of-choice for these technologies given our leading suite of products, intellectual property, industry expertise and the quality of our Red River plant.”

As the world’s need for sophisticated pollution control solutions grows, we expect to be a provider-of-choice for these technologies given our leading suite of products, intellectual property, industry expertise and the quality of our Red River plant. We remain highly encouraged by the progress we made in 2020 as well as by our prospects for 2021.

Our key areas of focus for 2021 are:

- Continue to protect our net RC cash flows. Tinuum is taking actions to ensure they continue to produce product while also updating their organization and cost structure for the upcoming winding down of operations.
- We will simultaneously leverage our Red River plant and its best-in-class characteristics to optimize our capacity to generate improved operating leverage. Part of this will be accelerating production to meet our commitments to our supply agreements with Cabot, identifying opportunities to improve earnings potential through customer and product mix and maintaining a focus on our cost-structure relative to go-forward business activities.
- And lastly, we are reiterating our near-term capital allocation focused on risk mitigation, cash preservation as well as necessary organic investment in our activated carbon business. We will continue to de-leverage, but the shareholder return component of our capital allocation plan remains on hold to preserve liquidity and ensure we are investing behind our strategic initiatives.

We would like to express our deep gratitude to all of our shareholders for their continued support. We share a bright future ahead as we pursue exciting opportunities for our products and technologies to ensure we maximize shareholder value. We look forward to updating everyone throughout 2021 on our strategic successes.

Sincerely,

A handwritten signature in black ink, appearing to read 'G. Marken', with a stylized, cursive script.

Greg Marken

Interim Chief Executive Officer

A handwritten signature in black ink, appearing to read 'L. Spencer Wells', with a stylized, cursive script.

L. Spencer Wells

Chairman of the Board

EXECUTIVE OFFICERS



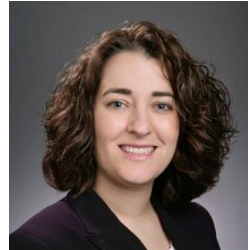
Greg P. Marken
Interim Chief Executive Officer



Joe Wong
Chief Product Officer



Ted J. Sanders
General Counsel



Morgan Fields
Vice President of Accounting

BOARD OF DIRECTORS



Gilbert S. Li⁽⁶⁾⁽⁷⁾
Co-Founder and Managing Partners
Alta Fundamental Advisers



R. Carter Pate⁽³⁾⁽⁵⁾⁽⁷⁾
Founder and Chief Executive Officer
Phoenix Effect



J. Taylor Simonton⁽²⁾
Director



L. Spencer Wells⁽¹⁾⁽⁶⁾
Partner
Drivetrain Advisors



Carol Eicher⁽⁴⁾⁽⁵⁾
Director
Tennant Company

- (1) Chairperson of the Board of Directors
- (2) Chairperson of the Audit Committee
- (3) Chairperson of the Compensation Committee
- (4) Chairperson of the Nominating and Governance Committee
- (5) Member of the Audit Committee
- (6) Member of the Compensation Committee
- (7) Member of the Nominating and Governance Committee

Shareholder Information

Stockholder Correspondence:

Advanced Emissions Solutions, Inc.
Attn: Corporate Secretary
8051 E. Maplewood Ave, Suite 210
Greenwood Village, CO 80111
Telephone: 888-822-8617

Transfer Agent:

Computershare
8742 Lucent Blvd, Suite 225
Highlands Ranch, CO 80129

INVESTOR RELATIONS:

Security analysts, investment professionals and stockholders can find investor relations information on the Internet at www.advancedemissionssolutions.com.

Inquiries should be directed to:
Alpha IR Group
Ryan Coleman or Chris Hodges
Telephone: 312-445-2870
Email: ades@alpha-ir.com

MARKET INFORMATION FOR COMMON STOCK

ADES common stock is quoted on the NASDAQ Global Market under the symbol "ADES."

ANNUAL MEETING OF STOCKHOLDERS

The annual meeting will be held on Tuesday June 15, 2021 via a virtual meeting. A notice of the meeting, together with a form of Proxy, a Proxy Statement, and the Annual Report will be made available to stockholders on or about April 27, 2021, at which time proxies will be solicited by the Board of Directors.

AVAILABILITY OF PROXY STATEMENT AND FORM 10-K

The Proxy Statement and the Form 10-K are available on ADES' web site at www.advancedemissionssolutions.com and at the SEC's web site at www.sec.gov. Additional copies of the Proxy Statement or the Annual Report may be obtained without charge by written request to the Corporate Secretary as listed above.

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Moss Adams LLP
1999 Broadway, Suite 4000
Denver, Colorado 80202

NON-INCORPORATION OF FORM 10-K "WRAP"

Advanced Emissions Solutions, Inc.'s Annual Report on Form 10-K for the fiscal year ended December 31, 2020, as filed with the SEC, is included within this Annual Report. Other than the Form 10-K, all other portions of this Annual Report are not "filed" with the SEC and should not be deemed so.

CERTIFICATIONS

The most recent certifications by our Principal Executive Officer and Principal Financial Officer pursuant to sections 302 and 906 of the Sarbanes-Oxley Act of 2002 are filed as exhibits to our Form 10-K.

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, 2020

or

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
Commission File Number: 001-37822

Advanced Emissions Solutions, Inc.

(Name of registrant as specified in its charter)

Delaware
(State of incorporation)

27-5472457
(IRS Employer
Identification No.)

8051 E. Maplewood Ave, Suite 210, Greenwood Village, CO, 80111
(Address of principal executive offices) (Zip Code)

(Registrant's telephone number, including area code): (720) 598-3500

Securities registered under Section 12(b) of the Act:

Class	Trading Symbol	Name of each exchange on which registered
Common stock, par value \$0.001 per share	ADES	NASDAQ Global Market

Securities registered under 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. Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the 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 Securities Exchange Act of 1934 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 and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes No

Indicate by check mark if disclosure of delinquent filers in response to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

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

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input checked="" type="checkbox"/>	Smaller Reporting Company	<input checked="" type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

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.

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

The aggregate market value of the voting stock held by non-affiliates of the registrant was approximately \$86.1 million based on the last reported bid price of the Common Stock on the NASDAQ Global Market on June 30, 2020. The number of shares outstanding of the registrant's Common Stock, par value \$0.001 per share, as of March 1, 2021 was 18,518,846.

Documents Incorporated By Reference

Portions of Part III of this Form 10-K are incorporated by reference from the Registrant's definitive proxy statement to be filed with the Securities and Exchange Commission no later than 120 days after the end of the Registrant's fiscal year.

ADVANCED EMISSIONS SOLUTIONS, INC.
ANNUAL REPORT ON FORM 10-K
FOR THE FISCAL YEAR ENDED DECEMBER 31, 2020

TABLE OF CONTENTS

	<u>Page</u>
<u>PART I.</u>	
<u>ITEM 1.</u> <u>Business</u>	<u>4</u>
<u>ITEM 1A.</u> <u>Risk Factors</u>	<u>14</u>
<u>ITEM 1B.</u> <u>Unresolved Staff Comments</u>	<u>24</u>
<u>ITEM 2.</u> <u>Properties</u>	<u>24</u>
<u>ITEM 3.</u> <u>Legal Proceedings</u>	<u>24</u>
<u>ITEM 4.</u> <u>Mine Safety Disclosures</u>	<u>24</u>
 <u>PART II.</u>	
 <u>ITEM 5.</u> <u>Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities</u>	 <u>25</u>
<u>ITEM 6.</u> <u>Selected Financial Data</u>	<u>25</u>
<u>ITEM 7.</u> <u>Management's Discussion and Analysis of Financial Condition and Results of Operations</u>	<u>26</u>
<u>ITEM 8.</u> <u>Financial Statements and Supplementary Financial Information</u>	<u>49</u>
 <u>ITEM 9.</u> <u>Changes in and Disagreements with Accountants on Accounting and Financial Disclosure</u>	 <u>97</u>
<u>ITEM 9A.</u> <u>Controls and Procedures</u>	<u>97</u>
<u>ITEM 9B.</u> <u>Other Information</u>	<u>98</u>
 <u>PART III.</u>	
 <u>ITEM 10.</u> <u>Directors, Executive Officers and Corporate Governance</u>	 <u>99</u>
<u>ITEM 11.</u> <u>Executive Compensation</u>	<u>99</u>
 <u>ITEM 12.</u> <u>Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters</u>	 <u>99</u>
<u>ITEM 13.</u> <u>Certain Relationships and Related Transaction and Director Independence</u>	<u>99</u>
<u>ITEM 14.</u> <u>Principal Accountant Fees and Services</u>	<u>99</u>
 <u>PART IV.</u>	
 <u>ITEM 15.</u> <u>Exhibits and Financial Statement Schedules</u>	 <u>100</u>
<u>ITEM 16.</u> <u>Form 10-K Summary</u>	<u>126</u>
 <u>SIGNATURES</u>	

PART I

Item 1. Business

General

ADA-ES, Inc. ("ADA"), a Colorado corporation, was incorporated in 1997. Pursuant to an Agreement and Plan of Merger, effective July 1, 2013, Advanced Emissions Solutions, Inc. ("ADES"), a Delaware company incorporated in 2011, succeeded ADA as the publicly-held corporation and ADA became a wholly-owned subsidiary of ADES. In 2018, ADA acquired ADA Carbon Solutions, LLC ("Carbon Solutions"). We acquired Carbon Solutions to enter into the broader activated carbon ("AC") market and to expand our product offerings in the mercury control industry and other complementary activated carbon markets. This Annual Report on Form 10-K is referred to as the "Form 10-K" or the "Report." As used in this Report, the terms the "Company," "we," "us" and "our" means ADES and its consolidated subsidiaries.

We sell consumable products that utilize AC and chemical-based technologies to a broad range of customers, including coal-fired utilities, industrials, water treatment plants, and other diverse markets. Our proprietary technologies and associated product offerings provide purification solutions to enable our customers to reduce certain contaminants and pollutants to meet the challenges of existing and potential regulations.

As of December 31, 2020 and 2019, we held equity interests of 42.5% and 50.0% in Tinum Group, LLC ("Tinum Group") and Tinum Services, LLC ("Tinum Services"), respectively, which are both unconsolidated entities, and both contribute significantly to our financial position and results of operations for the years ended December 31, 2020 and 2019. We account for Tinum Group and Tinum Services under the equity method of accounting. As described further below, both Tinum Group and Tinum Services expect to significantly wind down their operations by the end of 2021 and we believe our Refined Coal ("RC") business will substantially cease as of December 31, 2021.

As further discussed below, in December 2020, we changed our operational management structure, which resulted in a revision in our reporting segments, as defined under accounting principles generally accepted in the United States ("U.S. GAAP"), to two reporting segments, RC and Advanced Purification Technologies ("APT"). Historically we had two reporting segments, RC and Power Generation and Industrials ("PGI"). The reporting segments are discussed in more detail later in this section.

Customer Supply Agreement

On September 30, 2020, we and Cabot Norit Americas, Inc., ("Cabot") entered into a supply agreement (the "Supply Agreement") pursuant to which we agree to sell and deliver to Cabot, and Cabot agrees to purchase and accept from us, certain lignite-based activated carbon products ("Furnace Products"). The term of the Supply Agreement is for 15 years with 10-year renewal terms that are automatic unless either party provides three years prior notice of intention not to renew before the end of any term.

In addition to the sale by us and purchase by Cabot of Furnace Products, we and Cabot have agreed to additional terms whereby Cabot will reimburse us for certain capital expenditures we incur that are necessary to manufacture the Furnace Products. Reimbursements will be in the form of revenues earned from capital expenditures incurred that will benefit both us and Cabot and capital expenditures incurred that will benefit Cabot exclusively.

We believe the Supply Agreement will provide material incremental volume and capture lower operating cost efficiencies of our manufacturing plant located in Louisiana (the "Red River Plant"). As these incremental volumes come on-line and after our existing inventory balances are sold, we anticipate an increase in gross margins. Further, the Supply Agreement will expand our AC products to additional markets that are outside of coal-fired power generation.

On February 1, 2021, we and a subsidiary of Cabot Corporation ("Cabot Corporation") entered into a 5-year supply agreement ("EMEA Supply Agreement") to supply Cabot Corporation with lignite activated carbon products and other proprietary products used for mercury removal in utility and industrial coal-fired power plants in the EMEA market (as defined below). Cabot Corporation will be the exclusive and sole reseller of these products within Europe, Turkey, the Middle East and Africa ("EMEA"), and we will have a first right to provide the products to Cabot for sale in the EMEA.

Acquisition of Marshall Mine

Concurrently with the execution of the Supply Agreement, on September 30, 2020, we entered into an agreement to purchase (the "Mine Purchase Agreement") from Cabot 100% of the membership interests in Marshall Mine, LLC (the "Marshall Mine Acquisition") for a nominal cash purchase price. Marshall Mine, LLC owns a lignite mine located outside of Marshall, Texas (the "Marshall Mine"). Immediately after completion of the Mine Purchase Agreement, we independently determined to commence activities to shutter the Marshall Mine, and we will incur the associated reclamation costs.

In conjunction with the execution of the Supply Agreement and the Mine Purchase Agreement, on September 30, 2020, we entered into a reclamation contract (the "Reclamation Contract") with a third party that provides a capped cost, subject to certain contingencies, in the amount of approximately \$19.7 million plus an obligation to pay certain direct costs of approximately \$3.6 million (collectively, the "Reclamation Costs") over the estimated reclamation period of 10 years. Under the terms of the Supply Agreement, Cabot is obligated to reimburse us for \$10.2 million of Reclamation Costs (the "Reclamation Reimbursements"), which are payable semi-annually over 13 years and inclusive of interest. As of September 30, 2020, we recorded an asset retirement obligation related to the Reclamation Contract in the amount of \$21.3 million and a receivable related to the Reclamation Reimbursements in the amount of \$9.7 million.

As the owner of the Marshall Mine, we were required to post a surety bond to ensure performance of our reclamation activities in the amount of \$30.0 million under the Surety Bond Indemnification Agreement (the "Surety Agreement"). For the obligations due under the Reclamation Contract, we were required, under the Surety Agreement, to post initial collateral of \$5.0 million dollars as of September 30, 2020 and to post an additional \$5.0 million dollars as of March 31, 2021.

Markets

AC is a specialized sorbent material that is used widely in a host of industrial and consumer applications to remove impurities, contaminants or pollutants from gas, water and other product or waste streams. AC is produced by activating carbonaceous raw materials, including wood, coal, nut shells, resins and petroleum pitch. Properties such as surface area, pore volume and particle size can be specifically engineered to selectively target various contaminants to meet end-use application requirements. AC can come in several different forms that are important for the end-use application, including powdered activated carbon ("PAC"), granular activated carbon ("GAC"), pellets, honeycombs, blocks or cloths.

Key markets include removal of heavy metal pollutants from coal-fired electrical generation processes, treatment of drinking and waste waters, industrial acid gas and odor removal, automotive gasoline emission control, soil and ground water remediation, and food and beverage process and product purification.

The AC market has been and is expected to continue to be driven by increasing environmental regulations pertaining to water and air purification, especially in the mature and more industrialized areas of the world. Additionally, we believe environmental issues will continue to be the predominant force in the AC markets of rapidly developing countries.

We see opportunities to continue to pursue diverse markets for our purification products outside of coal-fire power generation, including industrial application, water treatment plants and other end markets.

Segments

Refined Coal

Tinuum Group provides reduction of mercury and nitrogen oxide ("NO_x") emissions at select coal-fired power generators through the production and sale of RC that qualifies for tax credits ("Section 45 tax credits") under the Internal Revenue Code ("IRC") *Section 45 - Production Tax Credit* ("IRC Section 45"). We benefit from Tinuum Group's production and sale of RC through our share of earnings from Tinuum Group's sales or leases of RC facilities to tax equity investors. Both Tinuum Group and Tinuum Services expect to significantly wind down their operations by the end of 2021 due to the expected expiration of the Section 45 tax credit period as of December 31, 2021. As such, our earnings and distributions from our RC segment will substantially cease as of December 31, 2021. See the separately filed financial statements of Tinuum Group included in Item 15 - "Exhibits, Financial Statement Schedules" ("Item 15") of this Report.

Products

Our patented M-45™ and M-45-PC™ technologies (collectively, the "M-45 Technology") are proprietary pre-combustion coal treatment technologies used to control emissions from circulating fluidized bed boilers and pulverized coal boilers, respectively.

Our patented CyClean™ technology, a pre-combustion coal treatment process provides electric power generators the ability to enhance combustion and reduce emissions of nitrogen oxides ("NO_x") and mercury from coals burned in cyclone boilers.

Our patents related to the RC segment are not expected to have significant commercial application post the expected expiration of the Section 45 tax credit period.

Sales and Customers

Our RC segment derives its revenues from license royalties ("M-45 Royalties") earned under a licensing arrangement (the "M-45 License") with Tinnuum Group for their use of our proprietary chemical technologies, M-45TM and M-45-PCTM (the "M-45 Technology") at their RC facilities to treat coal for the reduction of emissions of both NO_x and mercury. For the year ended December 31, 2020, M-45 Royalties comprised 22% of our total consolidated revenues. M-45 Royalties are recognized based upon a percentage of the per-ton, pre-tax margin as defined in the M-45 License. We also derive substantial earnings in the RC segment from our equity method investments in Tinnuum Group and Tinnuum Services. Both Tinnuum Group and Tinnuum Services expect to significantly wind down their operations by the end of 2021 due to the planned expiration of the Section 45 tax credit period as of December 31, 2021, and the loss of equity earnings and M-45 Royalties will have a material adverse effect on our financial condition and consolidated operating results compared to historical periods beginning in 2022. Additional information related to major customers is disclosed in Note 21 of the Consolidated Financial Statements included in Item 8 of this Report.

Coal-fired electricity generating units use RC as one of a portfolio of tools to help comply with Mercury and Air Toxics Standards ("MATS") and other environmental regulations. These RC facilities produce and sell RC that qualifies for Section 45 tax credits, including meeting the "placed in service" requirements (referred to as "placed in service"). The IRS has issued guidance regarding emissions reductions in the production of electricity by coal-fired electric generating units, including measurement and certification criteria necessary to qualify for the Section 45 tax credits. The ability to produce and sell RC and generate Section 45 tax credits, expires 10 years after each RC facility was placed in service, but not later than December 31, 2021. Two of Tinnuum Group's RC facilities reached their 10-year life in 2019, and Section 45 tax credits earned from these facilities expired in December 2019. As of December 31, 2020, Tinnuum Group has built and placed into service a total of 26 RC facilities that produce RC for sale to coal-fired electricity generating units, and which are still eligible to produce RC qualifying for Section 45 tax credits. The ability to generate Section 45 tax credits related to those remaining 26 RC facilities expires in 2021.

Once an RC facility is in operation, Tinnuum Group may lease or sell it to a tax equity investor, which we refer to as an "invested" RC facility. The tax equity investor subsequently operates the RC facility to produce and sell RC to a utility. It is financially advantageous for Tinnuum Group to lease or sell an RC facility, as the tax equity investor assumes the operating expenses for the RC facility and remits to Tinnuum Group either payments to purchase or lease payments to lease the RC facility. We benefit from equity income and cash distributions from Tinnuum Group. Tax equity investors may benefit from their investment in RC facilities through the realization of tax assets and credits from the production and sale of RC.

RC facilities that are producing and selling RC and have not been leased or sold, are referred to as "retained" RC facilities, whereby the RC is produced and sold by Tinnuum Group and, as an owner in Tinnuum Group, we benefit from the related Section 45 tax benefits. As of December 31, 2020 and 2019, the Section 45 tax credits were \$7.301 and \$7.173 per ton, respectively, of RC produced and sold to a utility. The value of the Section 45 tax credits is adjusted annually based on inflation adjustment factors published in the Federal Register. As of December 31, 2020, we have earned substantial tax credits from certain retained RC facilities through our ownership in Tinnuum Group, but have not been able to fully utilize them. See Note 18 to our Consolidated Financial Statements included in Item 8 - "Financial Statements and Supplementary Data" ("Item 8") of this Report for additional information regarding our net operating losses, tax credits and other deferred tax assets.

As of December 31, 2020, Tinnuum Group had 23 invested RC facilities producing RC at utility sites. Absent an extension of the Section 45 tax credit period, we do not believe that Tinnuum will enter into additional contracts for invested facilities during 2021. As of December 31, 2020, Tinnuum Group had nine facilities that are leased to affiliates of The Goldman Sachs Group (the "GS Affiliates"), and one of these GS Affiliates is also an owner of Tinnuum Group. A majority of Tinnuum Group's leases of RC facilities are periodically renewed and the loss of these investors or material modification to the lease terms of these facilities would have a significant adverse impact on Tinnuum Group's financial position, results of operations and cash flows, which in turn would have material adverse impact on our financial position, results of operations and cash flows.

Tinum Services operates and maintains RC facilities under operating and maintenance agreements with owners or lessees of RC facilities. The owners or lessees of the RC facilities pay Tinum Services, subject to certain limitations, the costs of operating and maintaining the RC facilities plus various fees. Tinum Services also arranges for the purchase and delivery of certain chemical additives under chemical agency agreements that include the chemicals required for our CyClean™ and M-45 Technologies that are necessary for the production of RC. The term of each chemical agency agreement runs concurrently with the respective RC facility's operating and maintenance agreement.

The following table provides summary information related to the Company's investment in Tinum Group and the related RC facilities as of December 31, 2020 and tons of RC produced and sold for the year ended December 31, 2020:

	# of RC Facilities	Not Operating	Operating	
			Invested	Retained
RC Facilities	26	3	23 (1)	—
RC tons produced and sold (000's)			64,982	693

The following tables provide summary information of Tinum Group's RC facilities as of December 31, 2019 and tons of RC produced and sold for the year ended December 31, 2019:

	# of RC Facilities	Not Operating	Operating	
			Invested	Retained
Facilities	26	6	20 (1)	—
RC tons produced and sold (000's)			66,481	1,505

(1) One RC facility was approximately 50% invested with an independent third party. As of December 31, 2019, the remaining approximate 50% was retained by Tinum Group, the Company and another member of Tinum Group. During the year ended December 31, 2020, Tinum Group sold its interest in this RC facility.

Competition

We believe Chem-Mod, LLC and licensees of Chem-Mod's technology are Tinum Group's principal competitors. Competition in the RC market is based primarily on price, the number of tons of coal burned at the coal-fired electric generating units where the RC facilities are operating and the tax compliance facts associated with each RC facility.

Raw Materials

The principal raw materials used in our RC products are comprised of non-bromine based halogens.

Operations

Tinum RC facilities are located at coal-fired power plants in the U.S. As of December 31, 2020, Tinum Group and Tinum Services had operations in 16 states.

Advanced Purification Technologies

Given the downward trends in the coal-fired power generation market, the prices of competing power generation sources as well as our recognition of the unavailability of Section 45 tax credits for RC after 2021, during 2020 we executed on plans to expand our AC products and diversify into new markets. As a result, internal changes, including changes in operating structure and the method in which the Chief Operating Decision Maker ("CODM") allocates resources, resulted in the change in reportable segments.

Products

Our AC and chemical products are used to purify coal-fired utilities, industrials, water treatment plants, and other markets. For the purification of air and gases, one of the uses of AC is to reduce mercury emissions and other air contaminants, specifically at coal-fired power generators and other industrial companies. Most of the North American coal-fired power generators installed equipment to control air pollutants, such as mercury, prior to or since the inception of the MATS. However, many power generators need consumable products on a recurring basis to chemically and physically capture mercury and other contaminants. AC has widely been adopted as the best available technology to capture mercury due to product efficiency and

effectiveness and currently accounts for over 50% of the mercury control consumables North American market. We offer AC and other chemical products and work with customers as they develop and implement a compliance control strategy that utilizes the consumables solutions that fit with their unique operating and pollutions control configuration.

For the purification of water, AC has been used in the treatment of drinking water, wastewater, contaminated soil and groundwater to absorb compounds causing unpleasant taste and odor and other contaminants. Both industrial and municipal wastewater treatment plants have deployed the use of AC in their treatment processes. Groundwater contamination has become a matter of increasing concern to federal and state governments as well as to the public, especially in the last 10 years. The U.S. AC market may see significant growth from water purification markets, especially if future regulations are passed controlling certain chemicals in drinking water. At present, individual states are primarily responsible for the protection of groundwater.

Coal, as a fuel source for electricity generation, continues to be a significant source of power generation, although significantly decreased from when coal was the primary power generation source for the country. We see opportunities to continue to pursue diverse markets for our purification products outside of coal-fired power generation, including industrial applications, water treatment plants and other diverse markets. We expect the Supply Agreement with Cabot, as discussed above, does help expand our AC products into some of those diverse end-markets.

Sales and Customers

Sales of consumables are primarily made by the Company's employees to a range of customers, including coal-fired utilities, industrial companies, water treatment plants and other customers. Some of our sales of AC are made under annual requirements-based contracts or longer-term agreements. Revenues from our top three customers comprised approximately 28% of our consolidated consumables revenues for the year ended December 31, 2020, and the loss of any of these customers would have a material adverse effect on the APT operating results.

Competition

Our primary competitors for consumable products include Cabot (CBT), Calgon Carbon, a subsidiary of Tokyo Stock Exchange listed Kuraray Co., Ltd., Donau Carbon Company, Midwest Energy Emissions Corp. (MEEC) and Nalco Holding Company, a subsidiary of Ecolab Inc. (ECL).

Raw Materials

The principal raw material we use in the manufacturing of AC is lignite coal, which is, in general, readily available and we believe we have an adequate supply through our ownership of the Five Forks Mine, which is operated for us by Demery Resources Company, LLC ("Demery"), a subsidiary of the North American Coal Company.

We purchase additives that are included in certain chemical products for resale to our customers through contracts with suppliers. The manufacturing of these consumable products is dependent upon certain discrete additives that are subject to price fluctuations and supply constraints. In addition, the number of suppliers who provide the necessary additives needed to manufacture our products are limited. Supply agreements with these producers are generally renewed on an annual basis.

Operations

We own and operate the Red River plant that is located in Louisiana. We also lease a manufacturing and distribution facility located in Louisiana. Additionally, we have sales, product development and administrative operations located in Colorado.

Research and Development Activities

We have conducted research and development directed towards product development related to the Supply Agreement and other markets. During the years ended December 31, 2020 and 2019, we incurred expenses of \$1.0 million and \$0.2 million, respectively.

Legislation and Environmental Regulations

Our products and services, as well as Tinnuum Group's production and sale of RC, are for the reduction of pollutants and other contaminants. To the extent that legislation and regulation limit the amount of pollutants and other contaminants permitted, the need for our products increases. Below is a summary of the primary legislation and regulation that affects the market for our products.

U.S. Federal Mercury and Air Toxic Standards ("MATS") Affecting Electric Utility Steam Generating Units

The U.S. Environmental Protection Agency ("EPA") final "MATS Rule" went into effect in April 2012. The EPA structured the MATS Rule as a MACT-based hazardous pollutant regulation applicable to coal and oil-fired Electric Utility Steam Generating Units ("EGU"), which generate electricity through steam turbines and have a capacity of 25 megawatts or greater, and provide for, among other provisions, control of mercury, control of acid gases such as hydrochloric acid ("HCl") and other Hazardous Air Pollutants ("HAPs"). Approximately 1,260 units were coal-fired EGUs when the rule was enacted. According to our estimates, the MATS Rule sets a limit that we believe requires the capture of up to 80-90% of the mercury in the coal burned in electric power generation boilers as measured at the exhaust stack outlet for most plants. The MACT standards are also known as National Emission Standards for Hazardous Air Pollutants ("NESHAP"). Plants generally had four years to comply with the MATS Rule, and we estimate that, based on data reported to the EPA and conversations with plant operators, most plants were required to comply by April 2016 and implementation of the MATS Rule is now largely complete. We estimate that 42% of the coal-fired EGUs that were operating in December 2011 when the MATS Rule was finalized have been permanently shut down, leaving approximately 527 EGUs in operation at the end of 2019.

In April 2017, a review by the U.S. Court of Appeals for the D.C. Circuit of a 2016 "supplemental finding" associated with the cost benefit analysis of the MATS Rule conducted by the EPA was stayed at the request of the Trump Administration. The court case continues to be stayed indefinitely. In May 2020, the EPA reconsidered and withdrew its 2016 "supplemental finding" associated with the cost benefit analysis of the MATS Rule. In this action, EPA found that it was not "appropriate and necessary" to regulate HAPs emissions from coal- and oil-fired EGUs. However, the EPA expressly stated that the reconsideration neither removed coal- and oil-fired EGUs from the list of sources that must comply with the MATS rule, nor rescinded the MATS Rule, which has remained continuously in effect. ADES joined a number of parties in seeking review of this EPA action before the U.S. Court of Appeals for the D.C. Circuit. President Biden identified EPA's withdrawal of the supplemental finding as one of the actions to be reviewed for conformity with Biden Administration policy, and in February 2021, the Biden Administration moved that the pending judicial review of the supplemental finding withdrawal be held in abeyance. The Court has granted the administration's motion, and this appeal also is now in abeyance. The MATS Rule remains in effect.

State Mercury and Air Toxics Regulations Affecting EGUs

In addition, certain states have their own mercury rules that are similar to or more stringent than the MATS Rule, and coal-fired electricity generating units in the U.S are subject to consent decrees that require the control of acid gases and particulate matter, in addition to mercury emissions.

U.S. Federal Industrial Boiler MACT

In January 2013, the U.S. EPA issued the final set of adjustments to the MACT-based air toxics standards for industrial boilers, including mercury, particulate matter, and acid gas emission limits. Existing boilers typically had until January 31, 2017 to comply with the rule. On December 1, 2014, the EPA announced the reconsideration of the industrial boiler MACT ("IBMACT") and proposed amendments to the version published January 31, 2013, representing technical corrections and clarifications. The proposed amendments do not affect the applicability of the final rule.

The EPA estimated that approximately 600 coal-fired boilers will be affected by IBMACT, in industries such as pulp and paper. Our estimates, based on conversations with plant operators, suggest that most of the affected plants have or will either shut down or switch fuels to natural gas to comply with the regulation.

Effluent Limitation Guidelines

In 2015, the EPA set the first federal limits known as effluent limitation guidelines ("ELGs") on the levels of toxic metals in wastewater that can be discharged from power plants. The final rule requires, among other things, zero discharge for fly ash and bottom ash transport water, and limits on mercury, arsenic, selenium, and nitrate from flue gas desulfurization ("FGD") wastewater. In September 2017, the EPA finalized a rule that delayed the original compliance deadlines for certain wastewater streams from November 2018 to November 2020, with the possibility that plants would not need to comply until December 2023 with state approval. In April 2019, the U.S. Court of Appeals for the Fifth Circuit struck down the EPA's ELGs that apply to leachate wastewater and "legacy wastewater," and directed the EPA to revise the limits on the levels of toxic metals in those wastewater streams. In November 2019, the EPA proposed to revise the ELGs for bottom ash and FGD wastewater. The final rule, published in the Federal Register on October 13, 2020 and effective on December 14, 2020, does not directly regulate halogens. It does, however, propose to establish a voluntary incentives program for the removal of certain halides. Though

under several (though not all) of the proposed treatment options that the EPA is considering, selenium in FGD wastewater would be regulated. Some halogens may impact the effectiveness of biological wastewater treatment systems that are often used for the removal of selenium.

Additional U.S. Legislation and Regulations

In 2015, the EPA finalized rules to reduce greenhouse gases ("GHGs") in the form of the Clean Power Plan ("CPP"), which established guidelines for states to follow in developing plans to reduce GHG emissions from fossil fuel-fired power plants. Under the CPP, states were required to prepare "State Plans" to meet state targets based on emission reductions from affected sources. The CPP was challenged by multiple states in the U.S. Court of Appeals for the District of Columbia Circuit ("DC Circuit"). The CPP was stayed by the U.S. Supreme Court. The DC Circuit held the CPP litigation in abeyance until April 28, 2017, and dismissed the case once the EPA replaced the CPP.

In July 2019, the EPA repealed the CPP and replaced it with the Affordable Clean Energy ("ACE") rule, which established guidelines for states to follow in developing plans to reduce GHG emissions from fossil fuel-fired power plants. ACE also requires states to prepare State Plans and prescribes that they must be based on heat rate improvements at affected plants. Numerous states, power companies, and non-governmental organizations challenged the ACE rule in the D.C. Circuit, which vacated the ACE rule on January 19, 2021.

International Regulations

There are various international regulations related to mercury control. In Canada, the Canada-Wide Standard ("CWS") was initially implemented in 2010, with increasingly stringent limits through 2020 and with varying mercury emissions caps for each province. China and Germany both have limits for mercury emissions that are less stringent than U.S. limits and are typically met using co-benefits from other installed air pollution control equipment designed to control other pollutants. In May 2017, the EU ratified the Minamata Convention on Mercury, triggering mercury control regulations with implementation starting in 2021. Specific emissions limits are currently being developed guided by the best available technologies reference ("BREF") document for limiting stack emissions and liquid effluents from industrial processes. The BREF conclusions for large coal-fired electricity generating units were adopted by the European Commission in July 2017.

Based upon the existing and potential regulations, we believe the international market for mercury control products may expand in the coming years. We believe the EMEA Supply Agreement will help facilitate positioning our patent portfolio and existing commercial products in the EMEA region.

Mining Environmental and Reclamation Matters

Federal, state and local authorities regulate the U.S. coal mining industry with respect to matters such as employee health and safety and the environment, including the protection of air quality, water quality, wetlands, special status species of plants and animals, land uses, cultural and historic properties and other environmental resources identified during the permitting process. Reclamation is required during production and after mining has been completed. Materials used and generated by mining operations must also be managed according to applicable regulations and law.

The Surface Mining Control and Reclamation Act of 1977 ("SMCRA"), establishes mining, environmental protection, reclamation and closure standards for all aspects of surface mining. Mining operators must obtain SMCRA permits and permit renewals from the Office of Surface Mining (the "OSM"), or from the applicable state agency if the state agency has obtained regulatory primacy. A state agency may achieve primacy if the state regulatory agency develops a mining regulatory program that is no less stringent than the federal mining regulatory program under SMCRA. The Five Forks Mine operates in Louisiana, which has achieved primacy and issues permits in lieu of the OSM. The Marshall Mine operates in Texas, which has achieved primacy and issues permits in lieu of the OSM.

Mine operators are often required by federal and/or state laws, including SMCRA, to assure, usually through the use of surety bonds, payment of certain long-term obligations including mine closure or reclamation costs, federal and state workers' compensation costs, coal leases and other miscellaneous obligations. Although surety bonds are usually noncancelable during their term, many of these bonds are renewable on an annual basis and collateral requirements may change. As of December 31, 2020, we posted a surety bond of approximately \$6.7 million for reclamation of the Five Forks Mine and \$30.0 million for the reclamation of Marshall Mine.

Patents

As of December 31, 2020, we held 71 U.S. patents and 15 international patents that were issued or allowed, 24 additional U.S. provisional patents or applications that were pending, and five international patent applications that were either pending or filed relating to different aspects of our technology. Our existing patents generally have terms of 20 years from the date of filing, with our next patents expiring beginning in 2021. We consider many of our patents and pending patents to be critical to the ongoing conduct of our business.

Seasonality of Activities

The sale of our consumable products and RC facility operation levels depend on the operations of the power generation units and industrial facilities to which the applicable consumables are provided and the location of the RC facilities, respectively. Power generation is weather dependent, with electricity and steam production varying in response to heating and cooling needs. Additionally, power generating units routinely schedule maintenance outages in the spring and/or fall depending upon the operation of the boilers. During the period in which an outage may occur, which may range from one week to over a month, no consumables are used and no RC is produced or sold, and our earnings and Tinnuum's revenues may be correspondingly reduced.

The sale of our AC products for water purification depends on demand from municipal water treatment facilities where these products are utilized. Depending on weather conditions and other environmental factors the summer months historically have the highest demand for PAC, as one of the major uses for PAC is for the treatment of taste and odor problems caused by increased degradation of organic contaminants and natural materials in water during the summer.

Safety, Health and Environment

Our operations are subject to numerous federal, state, and local laws, regulations, rules and ordinances relating to safety, health, and environmental matters ("SH&E Regulations"). These SH&E Regulations include requirements to maintain and comply with various environmental permits related to the operation of many of our facilities, including mine health and safety laws required for continued operation of the Five Forks Mine.

Employees

As of December 31, 2020, we employed 136 personnel, all of which were full-time employees; 35 employees were employed at our offices in Colorado and 101 employees were employed at our facilities in Louisiana.

Available Information

Our periodic and current reports are filed with the Securities and Exchange Commission ("SEC") pursuant to Section 13(a) of the Securities Exchange Act of 1934, as amended (the "Exchange Act") and are available free of charge within 24 hours after they are filed with, or furnished to, the SEC at the Company's website at www.advancedemissionsolutions.com. The filings are also available through the SEC at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549 or by calling 1-800-SEC-0330. Alternatively, these reports can be accessed at the SEC's website at www.sec.gov. The information contained on our website shall not be deemed incorporated by reference in any filing under the Securities Act of 1933, as amended (the "Securities Act") or the Exchange Act.

Copies of Corporate Governance Documents

The following Company corporate governance documents are available free of charge at our website at www.advancedemissionsolutions.com and such information is available in print to any stockholder who requests it by contacting the Secretary of the Company at 8051 E. Maplewood Ave, Suite 210, Greenwood Village CO, 80111.

- Certificate of Incorporation
- Bylaws
- Code of Ethics and Business Conduct
- Insider Trading Policy
- Whistleblower Protection Policy
- Board of Directors Responsibilities
- Audit Committee Charter
- Compensation Committee Charter
- Nominating and Governance Committee Charter

Forward-Looking Statements Found in this Report

This Report contains forward-looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act that involve risks and uncertainties. In particular such forward-looking statements are found in this Part I and under the heading in Part II, Item 7 below. Words or phrases such as "anticipates," "believes," "expects," "intends," "plans," "estimates," "predicts," the negative expressions of such words, or similar expressions are used in this Report to identify forward-looking statements, and such forward-looking statements include, but are not limited to, statements or expectations regarding:

- (a) the scheduled expiration of the IRC Section 45 tax credit period in 2021 and the resulting wind down of the business of, and loss of revenue from, Tinnuum Group and Tinnuum Services;
- (b) the production and sale of RC by RC facilities through the remainder of 2021 that will qualify for Section 45 tax credits;
- (c) expected growth or contraction in and potential size of our target APT markets, including the water purification, food and beverage and pharmaceuticals markets;
- (d) expected supply and demand for our APT products and services;
- (e) increasing competition in the APT market;
- (f) future level of research and development activities;
- (g) the effectiveness of our technologies and the benefits they provide;
- (h) probability of any loss occurring with respect to certain guarantees made by Tinnuum Group ("Party Guarantees");
- (i) the timing of awards of, and work and related testing under, our contracts and agreements and their value;
- (j) the timing and amounts of or changes in future revenues, royalties earned, backlog, funding for our business and projects, gross margins, expenses, earnings, tax rates, valuation allowance on our deferred tax assets, cash flows, license royalties, working capital, liquidity and other financial and accounting measures;
- (k) the outcome of current legal proceedings;
- (l) awards of patents designed to protect our proprietary technologies both in the U.S. and other countries;
- (m) the adoption and scope of regulations to control certain chemicals in drinking water; and
- (n) opportunities to effectively provide solutions to U.S. coal-related businesses to comply with regulations, improve efficiency, lower costs and maintain reliability.

Our expectations are based on certain assumptions, including without limitation, that:

- (a) coal will continue to be a significant source of fuel for electrical generation in the U.S.;
- (b) the IRS will allow the production and sale of RC to qualify for Section 45 tax credits through December 31, 2021;
- (c) we will continue as a key supplier of consumables to the coal-fired power generation industry as it seeks to implement reduction of mercury emissions;
- (d) we will be able to obtain adequate capital and personnel resources to meet our operating needs and to fund anticipated growth and our indemnity obligations;
- (e) Cabot will continue to purchase Furnace Products from us under the Supply Agreement in the quantities specified;
- (f) we will be able to establish and retain key business relationships with current and other companies;
- (g) orders we anticipate receiving will be received;
- (h) we will be able to formulate new consumables that will be useful to, and accepted by, the APT markets;
- (i) we will be able to effectively compete against others;
- (j) we will be able to meet any technical requirements of projects we undertake; and
- (k) we will be able to utilize the Section 45 tax credits we have earned before they expire.

The forward-looking statements included in this Report involve risks and uncertainties. Actual events or results could differ materially from those discussed in the forward-looking statements as a result of various factors including, but not limited to, timing of new and pending regulations and any legal challenges to or extensions of compliance dates of them; the U.S. government's failure to promulgate regulations that benefit our business; changes in laws and regulations, accounting rules, prices, economic conditions and market demand; impact of competition; availability, cost of and demand for alternative energy sources and other technologies; technical, start up and operational difficulties; decreases in the production of RC; our inability to commercialize our APT technologies on favorable terms; our inability to ramp up our operations to effectively address recent and expected growth in our APT business; loss of key personnel; availability of materials and equipment for our businesses; intellectual property infringement claims from third parties; pending litigation; as well as other factors relating to our business, as described in our filings with the SEC, with particular emphasis on the risk factor disclosures contained in those filings and in Item 1A - "Risk Factors" of this Report. You are cautioned not to place undue reliance on the forward-looking statements made in this Report and to consult filings we have made and will make with the SEC for additional discussion concerning risks and uncertainties that may apply to our business and the ownership of our securities. The forward-looking statements contained in this Report are presented as of the date hereof, and we disclaim any duty to update such statements unless required by law to do so.

Item 1A. Risk Factors

The following risks relate to us as of the date this Report is filed with the SEC. This list of risks is not intended to be exhaustive, but reflects what we believe are the material risks inherent in our business and the ownership of our securities as of the specified dates. A statement to the effect that the occurrence of a specified event may have a negative impact on our business, results of operations, profitability, financial condition, or the like, is intended to reflect the fact that such an event, if it occurs, would be likely to have a negative impact on your investment in ADES, but should not imply the likelihood of the occurrence of such specified event. The order in which the following risk factors are presented is not intended as an indication of the relative seriousness of any given risk.

Risks relating to Refined Coal

The ability to generate Section 45 tax credits from existing operating RC facilities ends in 2021, which will effectively eliminate Tinuum Group's and Tinuum Services' income and cash flows from operations and significantly impact our financial condition and results of operations beyond 2021.

Substantially all of our earnings and cash flows in 2020 and 2019 were comprised of equity method earnings from Tinuum Group and license royalties generated from certain of Tinuum Group's invested RC facilities. For the year ended December 31, 2020, our RC segment generated segment operating income of \$42.7 million. As of December 31, 2020, Tinuum Group has 23 invested facilities and no retained facilities. Absent an extension to the Section 45 tax credit period, the 23 invested facilities will no longer generate Section 45 tax credits beyond 2021. As a result, we believe that substantially all of the invested RC facilities will be returned to Tinuum Group upon the expiration of the Section 45 tax credit period. If Tinuum Group continues to operate these RC facilities, if any, its earnings will be significantly reduced and accordingly, our pro rata share will also be substantially reduced.

We will need to grow the earnings from our APT segment substantially to make up for the earnings we expect to lose from the winding down of our RC segment after the end of 2021, and there can be no assurances we will be able to fully replace these earnings.

From an earnings standpoint, our RC segment has been the larger of our two segments, and the APT segment must grow substantially, either organically or acquisitively, in order to replace earnings from Tinuum Group that will substantially end during 2021. There can be no assurance that we will be able to increase our APT segment earnings during 2021 or beyond to cover our current operating expenses or to provide a return to shareholders that is comparable to the return currently provided by our RC segment. If we are not able to cover operating expenses, we could be forced to raise additional capital, significantly reduce our operating expenses or take other alternative actions.

The ability of Tinuum Group to continue to generate revenues from the operation of RC facilities by tax equity investors is not assured, and the inability to operate RC facilities to produce and sell RC and generate Section 45 production tax credits could adversely affect our future growth and profitability.

Tinuum Group has successfully sold and leased RC facilities to third party investors. The termination or cancellation of existing RC facility leases, or the cessation of the production of refined coal by existing facilities, in the near term, would likely have an adverse effect on our future growth and profitability.

Our RC businesses are joint ventures and managed under operating agreements where we do not have sole control of the decision-making process, and we cannot mandate decisions or ensure outcomes.

We oversee our joint ventures under the terms of their respective operating agreements by participating in the following activities: (1) representation on the respective governing boards of directors, (2) regular oversight of financial and operational performance and controls and establishing audit and reporting requirements, (3) hiring of management personnel, (4) technical support of RC facilities, and (5) other regular and routine involvement with our joint venture partners. Notwithstanding this regular participation and oversight, our joint venture partners also participate in the management of these businesses and they may have business or economic interests that divert their attention from the joint venture, or they may prefer to operate the business, make decisions or invest resources in a manner that is contrary to our preferences. Since material business decisions must be made jointly with our joint venture partners, we cannot mandate decisions or ensure outcomes.

The financial effects of Tinuum Group providing indemnification under performance guarantees of its RC facilities are largely unknown and could adversely affect our financial condition.

Tinuum Group indemnifies certain utilities and lessees of RC facilities for particular risks associated with the operations of those facilities. We have provided limited, joint and several guarantees of Tinuum Group's obligations under those leases. Any substantial payments made under such guarantees could have a material adverse effect on our financial condition, results of operations and cash flows.

Presently, the GS Affiliates account for a substantial portion of earnings for Tinuum Group and any further lease renegotiation or termination by the GS Affiliates or any failure to continue to produce and sell RC at the GS Affiliates' RC facilities would have a material adverse effect on our business.

As of December 31, 2020, nine of Tinuum Group's 26 RC facilities are leased to the GS Affiliates. Significant components of our total cash flows come from Tinuum Group's distributions relating to payments received under these leases. These leases may be terminated at the option of the lessee at periodic intervals or upon the occurrence of specified events. In September 2019, Tinuum Group restructured all of the existing leases with the GS Affiliates, which resulted in a decrease in net lease payments for 2020 and 2021. Additional restructurings have occurred on certain GS Affiliate leases in 2020 and 2021, which have also resulted in a decrease in net lease payments for 2020 and 2021. If the GS Affiliates further renegotiate or terminate one or more of their leases, or if the utilities where the RC facilities are installed materially reduce their use of RC, these events would have a material adverse effect on our business, results of operations or financial condition.

Risks relating to our business

The COVID-19 pandemic and ensuing economic downturn has affected, and is expected to continue to affect and pose risks to our business, results of operations, financial condition and cash flows; and other epidemics or outbreaks of infectious diseases may have a similar impact.

In March 2020, the World Health Organization ("WHO") declared the outbreak of COVID-19 a global pandemic, which continues to spread throughout the United States ("U.S.") and the world and has resulted in authorities implementing numerous measures to contain the virus, including travel bans and restrictions, quarantines, shelter-in-place orders, and business limitations and shutdowns. We have been designated by Cybersecurity and Infrastructure Security Agency ("CISA") of the Department of Homeland Security as a critical infrastructure supplier to the energy sector. This designation provides some latitude in continuing to conduct our business operations compared to companies in other industries and markets. While we are unable to accurately predict the full impact that COVID-19 will have on our results from operations, financial condition, liquidity and cash flows due to numerous uncertainties, including the duration and severity of the pandemic and containment measures, our compliance with these measures has impacted our day-to-day operations and could continue to disrupt our business and operations, as well as that of our key customers, suppliers and other counterparties, for an indefinite period of time. To support the health and well-being of our employees, customers, partners and communities, a vast majority of our employees not directly involved in operating our plant have been working remotely since March 2020. In addition, many of our customers are working remotely, which may delay the timing of some orders and deliveries. The disruptions to our operations caused by COVID-19 have resulted, and are expected to continue to result in inefficiencies, delays and additional costs in our manufacturing, sales, marketing, and customer service efforts that we cannot fully mitigate through remote or other alternative work arrangements. Although such disruptions did not have a material adverse impact on our financial results for the first quarter of fiscal 2020, we incurred additional operating costs for the second quarter of fiscal year 2020, which included hazard pay, cleaning costs and sequestration costs related to our operating plant personnel. For 2021, we may see reduced demand for our products due to reduced interaction with our customers and our inability to target new customers and markets.

More generally, the pandemic raises the possibility of an extended global economic downturn and has caused volatility in financial markets, which could affect demand for our products and services and impact our results and financial condition even after the pandemic is contained and the shelter-in-place orders are lifted. For example, a decrease in orders in a given period could negatively affect our revenues in future periods, particularly if experienced on a sustained basis. We will continue to evaluate the nature and extent of the impact of COVID-19 to our business.

As previously disclosed, in April 2020, we entered into a loan (the "PPP Loan") in the amount of \$3.3 million through a bank under the Paycheck Protection Program sponsored by the U.S. Small Business Administration ("SBA"). We entered into the PPP Loan to provide additional liquidity in light of our COVID-19-related higher employee costs. Proceeds from the PPP Loan were used to cover a portion of our existing payroll and related expenses, including sequestration pay for certain employees, as well as certain other operating costs as permitted under the Paycheck Protection Program. We expect that current cash and cash

equivalent balances, inclusive of the PPP Loan, and cash flows that are generated from operations will be sufficient to meet our working capital needs and other capital and liquidity requirements for at least the next 12 months. However, if our business is more adversely impacted by COVID-19 than we expect, and our personnel costs remain higher than budgeted, our cash needs could increase.

Demand for our products and services depends significantly on environmental laws and regulations. Uncertainty as to the future of such laws and regulations, as well as changes to such laws and regulations, or granting of extensions of compliance deadlines has had, and will likely continue to have a material effect on our business.

A significant market driver for our existing products and services, and those planned in the future, are present and expected environmental laws and regulations, particularly those addressing the reduction of mercury and other emissions from coal-fired electricity generating units. If such laws and regulations are delayed, or are not enacted or are repealed or amended to be less strict, or include prolonged phase-in periods, or are not enforced, our business would be adversely affected by declining demand for such products and services. For example:

- a. The implementation of environmental regulations regarding certain pollution control and permitting requirements has been delayed from time to time due to various lawsuits. The uncertainty created by litigation and reconsiderations of rule-making by the EPA has negatively impacted our business, results of operations and financial condition and will likely continue to do so.
- b. To the extent federal, state, and local legislation mandating that electric power generating companies serving a state or region purchase a minimum amount of power from renewable energy sources such as wind, hydroelectric, solar and geothermal, and such amount lessens demand for electricity from coal-fired plants, the demand for our products and services would likely decrease.

Federal, state, and international laws or regulations addressing emissions from coal-fired electricity generating units, climate change or other actions to limit emissions, including public opposition to new coal-fired electricity generating units, has caused and could continue to cause electricity generators to transition from coal to other fuel and power sources, such as natural gas, nuclear, wind, hydroelectric and solar. The potential financial impact on us of future laws or regulations or public pressure will depend upon the degree to which electricity generators diminish their reliance on coal as a fuel source. That, in turn, will depend on a number of factors, including the specific requirements imposed by any such laws or regulations, the periods over which those laws or regulations are or will be phased in, the amount of public opposition, and the state and cost of commercial development of related technologies and processes. In addition, Public Utility Commissions ("PUCs") may not allow utilities to charge consumers for, and pass on the cost of, emissions control technologies without federal or state mandate. We cannot reasonably predict the impact that any such future laws or regulations or public opposition may have on our results of operations, financial condition or cash flows.

Action by the EPA related to MATS that decreases demand for our mercury removal products could have a material adverse effect on our APT segment.

Performance in our APT segment is largely dependent upon demand for mercury removal related product, which is largely impacted by the amount of coal-based power generation used in the U.S. and the continued regulation of utilities under MATS. In May 2020, the EPA reconsidered and withdrew its 2016 "supplemental finding" associated with the cost benefit analysis of the MATS Rule. In this action, the EPA found that it was not "appropriate and necessary" to regulate HAP emissions from coal- and oil-fired EGUs. However, the EPA expressly stated that the reconsideration neither removed coal- and oil-fired EGUs from the list of sources that must comply with the MATS rule, nor rescinded the MATS Rule, which has remained continuously in effect. ADES joined a number of parties in seeking review of this EPA action before the U.S. Court of Appeals for the D.C. Circuit. President Biden identified EPA's withdrawal of the supplemental finding as one of the actions to be reviewed for conformity with Biden Administration policy, and in February 2021, the Biden Administration moved that the pending judicial review of the withdrawal be held in abeyance. The Court has granted the administration's motion, and this appeal is also now in abeyance. The MATS Rule remains in effect. Any final action taken by the EPA related to MATS that decreases demand for our products for mercury removal will have a negative effect on the financial results of our PGI segment. The timing and content of the final reconsideration rule are unknown.

The failure of tariffs placed on U.S. imports of Chinese activated carbon to adequately address the impact of low-priced imports from China could have a material adverse effect on the competitiveness and financial performance of our APT segment.

Our APT segment faces competition in the U.S. from low-priced imports of activated carbon products. If the volumes of these low-priced imports increase, especially if they are sold at less than fair value, our sales of competing products could decline, which could have an adverse effect on the earnings of our APT segment. In addition, sales of these low-priced imports may negatively impact our pricing. To limit these activities, regulators in the U.S. have enacted an anti-dumping duty order on steam activated carbon products from China. In 2018, the order was extended for an additional five years. The amount of anti-dumping duties collected on imports of steam activated carbon from China is reviewed annually by the U.S. Department of Commerce. To the extent the anti-dumping margins do not adequately address the degree to which imports are unfairly traded, the anti-dumping order may be less effective in reducing the volume of these low-priced activated carbon imports in the U.S., which could negatively affect demand and/or pricing for our AC products.

The market for consumables and other products that provide pollutant reduction is highly competitive and some of our competitors are significantly larger and more established than we are, which could adversely impede our growth opportunities and financial results.

We operate in a highly competitive marketplace. Our ability to compete successfully depends in part upon our ability to maintain a production cost advantage, competitive technological capabilities and to continue to identify, develop and commercialize new and innovative products for existing and future customers. We may face increased competition from existing or newly developed products offered by industry competitors or other companies whose products offer a similar functionality as our products and could be substituted for our products, which may negatively affect demand for our products. In addition, market competition could negatively impact our ability to maintain or raise prices or maintain or grow our market position.

We compete against certain significantly larger and/or more established companies in the market for consumables and other products that provide mercury emissions reduction, water treatment and air purification.

Reduction of coal consumption by North American electricity power generators could result in less demand for our products and services. If utilities significantly reduce the number of coal-fired electricity generating units or the amount of coal burned, without a corresponding increase in the services required at the remaining units, this could reduce our revenues and materially and adversely affect our business, financial condition and results of operations.

The amount of coal consumed for North American electricity power generation is affected by, among other things, (1) the location, availability, quality and price of alternative energy sources for power generation, such as natural gas, fuel oil, nuclear, hydroelectric, wind, biomass and solar power; and (2) technological developments, including those related to competing alternative energy sources.

Natural gas-fueled generation and renewable energy generation has been displacing and may continue to displace coal-fueled generation, particularly from older, less efficient coal-powered generators. We expect that a significant amount of the new power generation necessary to meet increasing demand for electricity generation will be fueled by these sources. The price of natural gas has remained competitive for power generation and the use of natural gas is perceived as having a lower environmental impact than burning coal. Natural gas-fired plants are cheaper to construct, and permits to construct these plants are easier to obtain, and ongoing costs of natural gas-fired plants associated with meeting environmental compliance are lower. Possible advances in technologies and incentives, such as tax credits, that enhance the economics of renewable energy sources could make those sources more competitive than coal. Any reduction in the amount of coal consumed by domestic electricity power generators, whether as a result of new power plants utilizing alternative energy sources or as a result of technological advances, could reduce the demand for our current products and services, thereby reducing our revenues and materially and adversely affecting our business and results of operations.

Additionally, long-term changes in environmental regulation that threaten or preclude the use of coal or other fossil fuels as a primary fuel source for electricity production may result in the reduction or closure of a significant number of coal-fired electric generating units, and may adversely affect our business, financial condition and results of operations.

The loss of, or significant reduction in, purchases by our largest customers could adversely affect our business, financial condition or results of operations.

During the year ended December 31, 2020, we derived approximately 61% of our total consumable revenues from our ten largest customers. Many of these customers purchase our products to comply with emissions regulations, and if coal-fired generation decreases, it may have a negative impact on the amount of consumable products purchased. If any of our ten largest customers, were to significantly reduce the quantities of consumables they purchase from us, it may adversely affect our business, financial condition and results of operations.

Volatility in price and availability of raw materials can significantly impact our results of operations.

The manufacturing and processing of our consumable products requires significant amounts of raw materials. The price and availability of those raw materials can be impacted by factors beyond our control. Our consumable products, exclusive of lignite coal, use a variety of additives. Significant movements or volatility in the costs of additives could have an adverse effect on our working capital or results of operations. Additionally, we obtain certain raw materials from selected key suppliers. While we have inventory of such raw materials, if any of these suppliers are unable to meet their obligations with us on a timely basis or at an acceptable price, we may be forced to incur higher costs to obtain the necessary raw materials.

We may attempt to offset the increase in raw material costs with price increases allowed in our contractual relationships or through cost reduction efforts. If we are unable to fully offset the increased cost of raw materials through price increases, it could significantly impact our business, financial condition and results of operations.

We face operational risks inherent in mining operations and our mining operations have the potential to cause safety issues, including those that could result in significant personal injury.

We own the Five Forks Mine, a lignite coal mine located in Louisiana, which is operated for us by a third party. Mining operations by their nature involve a high level of uncertainty and are often affected by risks and hazards outside of our control. At the Five Forks Mine, the risks are primarily operational risks associated with the maintenance and operation of the heavy equipment required to dig and haul the lignite and risks relating to lower than expected lignite quality or recovery rates. The failure to adequately manage these risks could result in significant personal injury, loss of life, damage to mineral properties, production facilities or mining equipment, damage to the environment, delays in or reduced production and potential legal liabilities.

We also own the Marshall Mine, a former lignite coal mine located in Texas, which ceased mining operations in the third quarter of 2020 and is currently being reclaimed. Reclamation operations by their nature involve a high level of uncertainty and are often affected by risks and hazards outside of our control. At the Marshall Mine, the current risks are primarily operational risks associated with the maintenance and operation of the heavy equipment. The failure to adequately manage these risks could result in significant personal injury, loss of life, equipment, damage to the environment, delays in reclamation and potential legal liabilities.

Our operations and products are subject to extensive safety, health and environmental requirements that could increase our costs and/or impair our ability to manufacture and sell certain products.

Our ongoing operations are subject to extensive federal, state and local laws, regulations, rules and ordinances relating to safety, health and environmental matters, many of which provide for substantial monetary fines and criminal sanctions for violations. These include requirements to obtain and comply with various environmental-related permits for constructing any new facilities (or modifications to existing facilities) and operating all of our existing facilities. In addition, our Red River Plant may become subject to greenhouse gas emission trading requirements under which we may be required to purchase emission credits if our emission levels exceed our allocations. Greenhouse gas regulatory programs that have been adopted, such as cap-and-trade programs, have not had a significant impact on our business to date. Costs of complying with regulations could increase, as concerns related to greenhouse gases and climate change continue to emerge. The enactment of new environmental laws and regulations and/or the more aggressive interpretation of existing requirements could require us to incur significant costs for compliance or capital improvements or limit our current or planned operations, any of which could have a material adverse effect on our earnings or cash flow. We attempt to offset the effects of these compliance costs through price increases, productivity improvements and cost reduction efforts, and our success in offsetting any such increased regulatory costs is largely influenced by competitive and economic conditions and could vary significantly depending on the segment served. Such increases may not be accepted by our customers, may not be sufficient to compensate for increased regulatory costs or may decrease demand for our products and our volume of sales.

We may not be successful in achieving our growth expectations related to new products in our existing or new markets.

We may not be successful in achieving our growth expectations from developing new products for our existing or new markets. Further, we cannot ensure costs incurred to develop new products will result in an increase in revenues. Additionally, our ability to bring new products to the market will depend on various factors, including, but not limited to, solving potential technical or manufacturing difficulties, competition and market acceptance, which may hinder the timeliness and cost to bring such products to production. These factors or delays could affect our future operating results.

We may make future acquisitions or form partnerships and joint ventures that may involve numerous risks that could impact our financial condition, results of operations and cash flows.

Our strategy may include expanding our scope of products and services organically or through selective acquisitions, investments or creating partnerships and joint ventures. We have acquired, and may selectively acquire, other businesses, product or service lines, assets or technologies that are complementary to our business. We may be unable to find or consummate future acquisitions at acceptable prices and terms, or we may be unable to integrate existing or future acquisitions effectively and efficiently, and may need to divest those acquisitions. We continually evaluate potential acquisition opportunities in the ordinary course of business. Acquisitions involve numerous risks, including among others:

- our evaluation of the synergies and/or long-term benefits of an acquired business;
- integration difficulties, including challenges and costs associated with implementing systems, processes and controls to comply with the requirements of a publicly-traded company;
- diverting management's attention;
- litigation arising from acquisition activity;
- potential increased debt leverage;
- potential issuance of dilutive equity securities;
- entering markets in which we have no or limited direct prior experience and where competitors in such markets have stronger market positions;
- unanticipated costs and exposure to undisclosed or unforeseen liabilities or operating challenges;
- potential goodwill or other intangible asset impairments;
- potential loss of key employees and customers of the acquired businesses, product or service lines, assets or technologies;
- our ability to properly establish and maintain effective internal controls over an acquired company; and

- increasing demands on our operational and IT systems.

The success of acquisitions of businesses, new technologies and products, or arrangements with third parties is not always predictable and we may not be successful in realizing our objectives as anticipated. The Senior Term Loan and our bank line of credit facility contain certain covenants that limit, or that may have the effect of limiting, among other things, the payment of dividends, acquisitions, capital expenditures, the sale of assets and incurring additional indebtedness.

Natural disasters could affect our operations and financial results.

We operate facilities, including the Red River Plant and Five Forks Mine, that are exposed to natural hazards, such as floods, windstorms and hurricanes. Extreme weather events present physical risks that may become more frequent as a result of factors related to climate change. Such events could disrupt our supply of raw materials or otherwise affect production, transportation and delivery of our products or affect demand for our products.

In addition, extreme and unusually cold or hot temperatures throughout the U.S. could result in abnormally high loads on geographic electrical grids that could result in the failure of coal-fired power plants to produce electricity. If these plants were off-line for a significant period of time, the demand for our products could be less, which would impact our operations and financial results.

Information technology vulnerabilities and cyberattacks on our networks could have a material adverse impact on our business.

We rely on information technology ("IT") to manage and conduct business, both internally and externally, with our customers, suppliers and other third parties. Internet transactions involve the transmission and storage of data including, in certain instances, customer and supplier business information. Therefore, maintaining the security of computers and other electronic devices, computer networks and data storage resources is a critical issue for us and our customers and suppliers because security breaches could result in reduced or lost ability to carry on our business and loss of and/or unauthorized access to confidential information.

We have limited personnel and other resources to address information technology reliability and security of our computer networks and to respond to known security incidents to minimize potential adverse impact. Experienced hackers, cybercriminals and perpetrators of threats may be able to penetrate our network security and misappropriate or compromise our confidential information or that of third parties, create system disruptions or cause shutdowns. These perpetrators of cyberattacks also may be able to develop and deploy viruses, worms, malware and other malicious software programs that attack our information and networks or otherwise exploit any security vulnerabilities of our information and networks.

Techniques used to obtain unauthorized access to or sabotage systems change frequently and often are not recognized until long after being launched against a target, and we may be unable to anticipate these techniques or to implement adequate preventative measures. A breach of our IT systems and security measures as a result of third party action, malware, employee error, malfeasance or otherwise could materially adversely impact our business and results of operations and expose us to customer, supplier and other third party liabilities.

Risks related to intellectual property

Failure to protect our intellectual property or infringement of our intellectual property by a third party could have an adverse impact on our financial condition.

We rely on a combination of patent, copyright and trademark laws, trade secrets, confidentiality procedures and contractual provisions to protect our proprietary rights. Such means of protecting our proprietary rights may not be adequate because they provide only limited protection or such protection may be prohibitively expensive to enforce. We also enter into confidentiality and non-disclosure agreements with our employees, consultants and many of our customers and vendors, and generally control access to and distribution of our proprietary information. Notwithstanding these measures, a third party could copy or otherwise obtain and use our proprietary information without authorization. We cannot provide assurance that the steps we have taken will prevent misappropriation of our technology and intellectual property, which could negatively impact our business and financial condition. In addition, such actions by third parties could divert the attention of our management from the operation of our business.

We may be subject to intellectual property infringement claims from third parties that are costly to defend and that may limit our ability to use the disputed technologies.

If our technologies are alleged to infringe the intellectual property rights of others, we may be forced to mount a defense to such claims, which may be expensive and time consuming. During the pendency of litigation, we could be prevented from marketing and selling existing products or services and from pursuing research, development or commercialization of new or complimentary products or services. Further, we may be required to obtain licenses to third party intellectual property or be forced to develop or obtain alternative technologies. Our failure to obtain a license to a technology that we may require, or the need to develop or obtain alternative technologies, could significantly and negatively affect our business.

Indemnification of third-party licensees of our technologies against intellectual property infringement claims concerning our licensed technology and our products could be financially significant to us.

We have agreed to indemnify licensees of our technologies (including Tinum Group) and purchasers of our products, and we may enter into additional agreements with others under which we agree to indemnify and hold them harmless from losses they may incur as a result of the alleged infringement of third-party rights caused by the use of our technologies and products. Infringement claims, which are expensive and time-consuming to defend, could have a material adverse effect on our business, operating results and financial condition, even if we are successful in defending ourselves (and the indemnified parties) against them.

Our future success depends in part on our ongoing identification and development of intellectual property and our ability to invest in and deploy new products, services and technologies into the marketplace efficiently and cost effectively.

The process of identifying customer needs and developing and enhancing products, services and solutions for our business segments is complex, costly and uncertain. Any failure by us to identify and anticipate changing needs, emerging trends and new regulations could significantly harm our future market share and results of operations.

Risk related to tax matters

An "ownership change" could limit our ability to utilize tax loss and credit carryforwards to offset future taxable income.

We have certain general business credit tax credits ("Tax Credits"). As of December 31, 2020, we had \$93.9 million of Tax Credits, equaling 86% of our total gross deferred tax assets. Our ability to use these Tax Credits to offset future taxable income may be significantly limited if we experience an "ownership change" as discussed below. Under the Internal Revenue Code ("IRC") and regulations promulgated by the U.S. Treasury Department, we may carry forward or otherwise utilize the Tax Credits in certain circumstances to offset any current and future taxable income, and thus reduce our federal income tax liability, subject to certain requirements and restrictions. To the extent that the Tax Credits do not otherwise become limited, we believe that we will have available a significant amount of Tax Credits in future years, and therefore the Tax Credits could be a substantial asset to us. However, if we experience an "ownership change," as defined in Sections 382 and 383 of the IRC, our ability to use the Tax Credits may be substantially limited, and the timing of the usage of the Tax Credits could be substantially delayed, which could therefore significantly impair the value of that asset.

In general, an "ownership change" under Sections 382 and 383 occurs if the percentage of stock owned by an entity's 5% stockholders (as defined for tax purposes) increases by more than 50 percentage points over a rolling three-year period. An entity that experiences an ownership change generally will be subject to an annual limitation on its pre-ownership change tax loss and credit carryforwards equal to the equity value of the entity immediately before the ownership change, multiplied by the long-term, tax-exempt rate posted monthly by the IRS (subject to certain adjustments). The annual limitation would be increased each year to the extent that there is an unused limitation in a prior year. The limitation on our ability to utilize the Tax Credits arising from an ownership change under Sections 382 and 383 of the IRC would depend on the value of our equity at the time of any ownership change. If we were to experience an "ownership change," it is possible that a significant portion of our tax credit carryforwards could expire before we would be able to use them to offset future taxable income.

On May 5, 2017, our Board of Directors (the "Board") approved the Tax Asset Protection Plan (the "TAPP") and declared a dividend of one preferred share purchase right (each, a "Right") for each outstanding share of our common stock. The TAPP was adopted in an effort to protect stockholder value by attempting to diminish the risk that our ability to use the Tax Credits to reduce potential future federal income tax obligations may become substantially limited.

On April 8, 2020, the Board approved the Third Amendment to the TAPP ("Third Amendment") that amended the TAPP, as previously amended by the First and Second Amendments that were approved by the Board on April 6, 2018 and April 5, 2019, respectively. The Third Amendment amended the definition of "Final Expiration Date" under the TAPP to extend the duration of the TAPP and makes associated changes in connection therewith. At our 2020 annual meeting of stockholders, our stockholders approved the Third Amendment, thus the Final Expiration Date will be the close of business on December 31, 2021.

The TAPP, as amended, is intended to act as a deterrent to any person acquiring beneficial ownership of 4.99% or more of our outstanding common stock without the approval of the Board. Stockholders who beneficially owned 4.99% or more of our outstanding common stock upon execution of the Protection Plan will not trigger the Protection Plan so long as they do not acquire beneficial ownership of additional shares of our common stock. The Board may, in its sole discretion, also exempt any person from triggering the Protection Plan.

Risks relating to our common stock

Our stock price is subject to volatility.

The market price of our common stock has experienced substantial price volatility in the past and may continue to do so. The market price of our common stock may continue to be affected by numerous factors, including:

- a. actual or anticipated fluctuations in our operating results and financial condition;
- b. changes in laws or regulations and court rulings and trends in our industry;
- c. The expiration of the Section 45 Tax credit period and/or Tinnium Group's ability to lease or sell RC facilities;
- d. announcements of sales awards;
- e. changes in supply and demand of components and materials;
- f. adoption of new tax regulations or accounting standards affecting our industry;
- g. changes in financial estimates by securities analysts;
- h. perceptions of the value of corporate transactions;
- i. trends in social responsibility and investment guidelines;
- j. whether we are able and elect to pay cash dividends;
- k. the continuation of repurchasing shares of common stock under stock repurchase programs; and
- l. the degree of trading liquidity in our common stock and general market conditions.

From January 1, 2019 to December 31, 2020, the closing price of our common stock ranged from \$3.76 to \$14.84 per share. In June 2017, we commenced a quarterly cash dividend program and paid out cash dividends in each succeeding quarter through March 31, 2020. In 2019 and 2020, we implemented stock repurchase programs, and repurchased a total of 553,958 shares of our common stock for the fiscal years 2019 and 2020 for cash of \$6.0 million.

Stock price volatility over a given period may cause the average price at which we repurchase shares of our common stock to exceed the stock's price at a given point in time. We believe our stock price should reflect expectations of future growth and profitability. Future dividends are subject to declaration by the Board, and under our current stock repurchase program, we are not obligated to acquire any specific number of shares. If we fail to meet expectations related to future growth, profitability, dividends, stock repurchases or other market expectations, our stock price may decline significantly, which could have a material adverse impact on our ability to obtain additional capital, investor confidence and employee retention, and could further reduce the liquidity of our common stock.

There can be no assurance that we will resume declaring cash dividends at all or in any particular amounts.

We last paid a cash dividend on March 10, 2020. The Board first approved a \$0.25 per share of common stock quarterly dividend in June 2017. During 2019 and 2020, we declared quarterly dividends in the aggregate amount of \$23.2 million.

The payment of future dividends will be affected by, among other factors: compliance with debt covenants; our views on potential future capital requirements for investments in acquisitions; legal risks; stock repurchase programs; changes in federal and state income tax laws or corporate laws; changes to our business model; and interest and principal payments for 2021 required under the terms of the Senior Term Loan; and any additional indebtedness that we may incur in the future.

Under a covenant provided for the Senior Term Loan that requires a minimum for expected future net cash flows from refined coal business, as of December 31, 2020, we are precluded from paying dividends or repurchasing shares of our common stock until such time that we repay all outstanding principal and accrued interest related to the Senior Term Loan, absent a modification to the Senior Term Loan.

Our dividend payments may change from time to time, and we cannot provide assurance that we will resume paying dividends at all or in any particular amounts. Our election to not resume dividend payments could have a negative effect on our stock price.

Our certificate of incorporation and bylaws contain provisions that may delay or prevent an otherwise beneficial takeover attempt of us.

Certain provisions of our certificate of incorporation and bylaws could make it more difficult for a third party to acquire us, even if doing so would be beneficial to our stockholders. These include provisions that:

- a. Limit the business at special meetings to the purpose stated in the notice of the meeting;
- b. Authorize the issuance of "blank check" preferred stock, which is preferred stock with voting or other rights or preferences that could impede a takeover attempt and that the Board can create and issue without prior stockholder approval;
- c. Establish advance notice requirements for submitting nominations for election to the Board and for proposing matters that can be acted upon by stockholders at a meeting; and
- d. Require the affirmative vote of the "disinterested" holders of a majority of our common stock to approve certain business combinations involving an "interested stockholder" or its affiliates, unless either minimum price criteria or procedural requirements are met, or the transaction is approved by a majority of our "continuing directors" (known as "fair price provisions").

These provisions, alone or in combination with each other, may discourage transactions involving actual or potential changes of control, including transactions that otherwise could involve payment of a premium over prevailing market prices to holders of our common stock, or could limit the ability of our stockholders to approve transactions that they may deem to be in their best interest.

An increased focus on environmental, social and governance factors by institutional investors may negatively impact our access to capital and the liquidity of our stock price.

Some institutional investors have recently adopted Environmental, Social and Governance ("ESG") investing guidelines that may prevent them from increasing or taking new stakes with companies with exposure to fossil fuels. Additional institutional investors may adopt similar ESG investment guidelines. This could limit the demand for owning our common stock and/or our access to capital. If such capital is desired, we cannot assure you that we will be able to obtain any additional equity or debt financing on terms that are acceptable to us. Given these emerging trends, liquidity in our common stock and our stock price may be negatively impacted.

We may require additional funding for our growth plans, and such funding may require us to issue additional shares of our common stock, resulting in a dilution of your investment.

We estimate our funding requirements in order to implement our growth plans. If the funding required to implement growth plans should exceed these estimates significantly, or if we come across opportunities to grow through expansion plans which cannot be predicted at this time, or our funds generated from our operations prove insufficient for such purposes, we may need to raise additional funds to meet these funding requirements.

These additional funds may be raised by issuing equity or debt securities or by borrowing from banks or other resources. We cannot assure you that we will be able to obtain any additional financing on terms that are acceptable to us, or at all. If we fail to

obtain additional financing on terms that are acceptable to us, we may not be able to implement such plans fully. Such financing, even if obtained, may be accompanied by conditions that limit our ability to pay dividends or require us to seek lenders' consent for payment of dividends, or restrict our freedom to operate our business by requiring lender's consent for certain corporate actions. Further, if we raise additional funds through the issuance of new shares of our common stock, any shareholders who are unable or unwilling to participate in such an additional round of fund raising may suffer dilution of their investment.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Offices and Facilities

We lease office space in Greenwood Village, Colorado for our corporate headquarters and primary laboratory comprising approximately 21,000 square feet.

We also lease or own manufacturing, storage and distribution facilities in Louisiana. Our manufacturing plant is located on approximately 59 acres and the remaining facilities are comprised of a total of approximately 310,000 square feet.

Mining

As of December 31, 2020, we owned or controlled primarily through long-term leases approximately 4,570 acres of coal land for surface mining. Of those acres, approximately 1,980 acres are located in Natchitoches Parish, Louisiana ("Five Forks"). The majority of the Five Forks land is leased for mineral rights and right-of-use purposes that expire at varying dates over the next 30 years and contain options to renew. The remaining land is owned by us.

Under our current mining plans, substantially all leased reserves will be mined out within the period of existing leases or within the time period of assured lease renewals. Royalties are paid to lessors either as a fixed price per ton or as a percentage of the gross sales price of the mined coal. The majority of the significant leases are on a percentage royalty basis. In some cases, a payment is required either at the time of execution of the lease or in annual installments. In most cases, the prepaid royalty amount is applied to reduce future production royalties.

The remaining 2,590 acres (of 4,570 acres of coal land for surface mining) were acquired on September 30, 2020 and located in Harrison and Panola Counties, Texas. Mining operations on this land ceased in the third quarter of 2020.

In 2018, the SEC issued new rules for disclosures under this Item for mining registrants. These rules amend Item 102 of Regulation S-K under the Securities Act and the Exchange Act and rescind Industry Guide 7 to direct mining registrants, and create a new subpart of Regulation S-K, which contains all of the requirements for property disclosures by mining registrants from and after January 1, 2021 (the "Mining Disclosures"). The Mining Disclosures became effective on February 25, 2019 and allow mining registrants a transition period through January 1, 2021 to comply. We elected to adopt the Mining Disclosures effective February 25, 2019 and were subject to the requirements effective with the filing of our Annual Report on Form 10-K for the fiscal year ended December 31, 2018. Based on the materiality and the vertically-integrated company guidelines contained in the Mining Disclosures, we have concluded that no additional disclosures related to our mining operations are required under this Item.

Item 3. Legal Proceedings

From time to time, we are involved in various litigation matters arising in the ordinary course of our business. Information with respect to this item may be found in Note 14 "Commitments and Contingencies" to the consolidated financial statements included in Item 8 of this Report.

Item 4. Mine Safety Disclosures

The statement concerning mine safety violations or other regulatory matters required by Section 1503(a) of the Dodd-Frank Wall Street Reform and Consumer Protection Act and Item 104 of Regulation S-K is included in Exhibit 95 to this Report.

PART II

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

Market for Our Common Stock

As of December 31, 2020, our common stock was quoted on the NASDAQ Global Market under the symbol "ADES." The trading volume for our common stock is relatively limited. There is no assurance that an active trading market will provide adequate liquidity for our existing stockholders or for persons who may acquire our common stock in the future.

Dividends

In June 2017, we commenced a quarterly cash dividend program of \$0.25 per common share and made our most recent payment in March 2020.

In the future, we may declare and pay a cash dividend on shares of our common stock. Whether we do, however, and the timing and amounts of dividends will be subject to approval and declaration by the Board and will depend on a variety of factors including, but not limited to, our financial results, cash requirements, financial condition, compliance with loan covenants and other contractual restrictions and other factors considered relevant by the Board, and will be subject to limitations imposed under Delaware law.

Holdings

The number of holders of record of our common stock as of March 1, 2021 was approximately 900. The approximate number of beneficial stockholders is estimated at 6,900.

Purchases of Equity Securities by the Company and Affiliated Purchasers

We had no repurchases of our common stock for the three months ended December 31, 2020.

We maintain a program to repurchase up to \$20.0 million of shares of our common stock under a stock repurchase program (the "Stock Repurchase Program") through open market transactions at prevailing market prices. The Board most recently approved an amendment to The Stock Repurchase Program in which it authorized an incremental \$7.1 million, resulting in a total of \$10.0 million allowable to repurchase. As of December 31, 2020, \$7.0 million remained outstanding to repurchase shares of our common stock under the Stock Repurchase Program, which will remain in effect until all amounts are utilized or it is otherwise modified by the Board.

Item 6. Selected Financial Data

The information under this Item is not required to be provided by smaller reporting companies.

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

Overview

We operate two segments: RC and APT. Our RC segment is comprised of our equity ownership in Tinuum Group and Tinuum Services, both of which are unconsolidated entities in which we generate substantial earnings. Tinuum Group provides reduction of mercury and NOx emissions at select coal-fired power generators through the production and sale of RC that qualifies for Section 45 tax credits under IRC Section 45. We benefit from Tinuum Group's production and sale of RC, which generates tax credits, as well as its revenue from selling or leasing RC facilities to tax equity investors. We also earn royalties for technologies that we license to Tinuum Group and are used at certain RC facilities to enhance combustion and reduced emissions of NOx and mercury from coal burned to generate electrical power. Tinuum Services operates and maintains the RC facilities under operating and maintenance agreements with Tinuum Group and owners or lessees of the RC facilities. Both Tinuum Group and Tinuum Services expect to significantly wind down their operations by the end of 2021 due to the expected expiration of the Section 45 tax credit period as of December 31, 2021. As such, our earnings and distributions from our RC segment will substantially cease as of December 31, 2021.

Our APT segment is materially operated through a wholly-owned subsidiary, Carbon Solutions, which we acquired on December 7, 2018 (the "Carbon Solutions Acquisition"). We sell consumable products that utilize AC and chemical based technologies to a broad range of customers, including coal-fired utilities, industrials, water treatment plants, and other diverse markets through the customer supply agreement defined below. Our primary products are comprised of AC, which is produced from lignite coal. Our AC products include PAC and GAC. Our proprietary technologies and associated product offerings provide purification solutions to enable our customers to reduce certain contaminants and pollutants to meet the challenges of existing and potential regulations. Additionally, through Carbon Solutions, we also own an associated lignite mine that supplies the primary raw material for manufacturing our products.

See further discussion of our business included in Item 1 - "Business" ("Item 1") of this Report. Discussion regarding segment information is included in the discussion of our consolidated results under this Item 7. Additionally, discussion related to our reportable segments is included in Item 1 and Note 19 of the Consolidated Financial Statements, which are included in Item 8 of this Report.

We believe there are opportunities to continue to pursue diverse markets for our purification products outside of coal-fire power generation, including industrial applications and water. The Supply Agreement with Cabot, as discussed below, will help our expansion of our AC products to those diverse end-markets and drive the Company's post-Refined Coal future.

Drivers of Demand and Key Factors Affecting Profitability

Drivers of demand and key factors affecting our profitability differ by segment. In the RC segment, demand is driven primarily from investors who purchase or lease RC facilities that qualify under the Section 45 tax credit period, which is expected to expire no later than December 31, 2021. Operating results in RC are affected by: (1) the ability to sell, lease or operate RC facilities; (2) lease renegotiation or termination; and (3) changes in tonnage of RC due to changing coal-fired dispatch and electricity power generation sources. Earnings and distributions from our RC segment will substantially cease as of December 31, 2021 as a result the significant wind down of both Tinuum Group and Tinuum Services due to the expected expiration of the Section 45 tax credit period as of December 31, 2021.

In the APT segment, demand is driven primarily by consumables-based solutions for coal-fired power generation and other industrials, municipal water customers, and since September 30, 2020, demand from Cabot's customers through the Supply Agreement discussed below. Operating results in APT has been influenced by: (1) changes in our sales volumes; (2) changes in price and product mix; and (3) changes in coal-fired dispatch and electricity power generation sources.

Customer Supply Agreement

On September 30, 2020, we and Cabot entered into the Supply Agreement pursuant to which we agree to sell and deliver to Cabot, and Cabot agrees to purchase and accept from us, Furnace Products. The term of the Supply Agreement is for 15 years with 10-year renewal terms that are automatic unless either party provides three years prior notice of intention not to renew before the end of any term.

In addition to the sale by us and purchase by Cabot of Furnace Products, we and Cabot have agreed to additional terms whereby Cabot will reimburse us for certain capital expenditures incurred by us that are necessary to manufacture the Furnace Products. Reimbursements will be in the form of revenues earned from capital expenditures incurred that will benefit both us and Cabot (referred to as "Shared Capital") and capital expenditures incurred that will benefit Cabot exclusively (referred to as "Specific Capital").

We believe the Supply Agreement will provide material incremental volume and capture lower operating cost efficiencies of our manufacturing plant. As these incremental volumes come on-line and after our existing inventory balances are sold, we anticipate an increase in gross margins. Further, we expect the Supply Agreement will expand our activated carbon products to diverse end markets that are outside of coal-fired power generation.

Acquisition of Marshall Mine

Concurrently with the execution of the Supply Agreement, on September 30, 2020, we entered into the Mine Purchase Agreement from Cabot 100% of the membership interests in Marshall Mine, LLC (the "Marshall Mine Acquisition") for a nominal purchase price. Marshall Mine, LLC owns a lignite mine located outside of Marshall, Texas (the "Marshall Mine"). We independently determined to immediately commence activities to shutter the Marshall Mine and will incur the associated reclamation costs.

In conjunction with the execution of the Supply Agreement and the Mine Purchase Agreement, on September 30, 2020, we entered into the Reclamation Contract with a third party that provides a capped cost, subject to certain contingencies, in the amount of approximately \$19.7 million plus an obligation to pay certain direct costs of approximately \$3.6 million (collectively, the "Reclamation Costs") over the estimated reclamation period of 10 years. We are accounting for this obligation as an asset retirement obligation under U.S. GAAP. Under the terms of the Supply Agreement, Cabot is obligated to reimburse us for \$10.2 million of Reclamation Costs (the "Reclamation Reimbursements"), which are payable semi-annually over 13 years and inclusive of interest.

As the owner of the Marshall Mine, we were required to post a surety bond to ensure performance of our reclamation activities in the amount of \$30.0 million under the Surety Agreement. For the obligations due under the Reclamation Contract, we were required to post collateral of \$5.0 million dollars as of September 30, 2020 and to post an additional \$5.0 million dollars as of March 31, 2021.

Settlement with Former Customer

On December 29, 2020, we and a former customer (the "Parties") reached a settlement (the "Settlement") on various litigation matters (the "Litigation Matters") that resulted in the former customer (the "Former Customer") agreeing to pay to us cash of \$2.5 million (the "Settlement Amount"), which was received on January 27, 2021. This payment was in exchange for full dissolution of all claims and counterclaims that the two Parties have asserted or could have asserted against each other in the Litigation Matters, or which have arisen or may arise against each other but are presently unknown, arising out of or related to the Litigation Matters and related to any other of the Parties' business dealings, conduct and/or transactions through the date of the Settlement, including all claims for damages, fees, costs, sanctions, or any other amounts due or to become due in connection with the foregoing. We applied the Settlement Amount cash proceeds to both an outstanding trade account receivable and note receivable due from the Former Customer and recognized the excess cash received as a gain from the Settlement of \$1.1 million, which is included as a reduction of operating expenses for the year ended December 31, 2020. See further discussion under "Results of Operations" under this Item 7.

Impact of COVID-19

In March 2020, the WHO declared COVID-19 a global pandemic. We are designated by CISA of the Department of Homeland Security as a critical infrastructure supplier to the energy sector. Our operations have been deemed essential and, therefore, our facilities remain open and our employees employed. We follow the COVID-19 guidelines from the Centers for Disease Control concerning the health and safety of our personnel, including remote working for those that have the ability to do so, sequestered employees at our plant and other health safety measures. Additionally, we have taken proactive and precautionary steps to ensure the safety of our employees, customers and suppliers, including frequent cleaning and disinfection of workspaces, property, plant and equipment, instituting social distancing measures and mandating remote working environments, where possible, for all employees. These measures have resulted in an increase in our personnel costs, operational inefficiencies and the incurrence of incremental costs to allow manufacturing operations to continue; while at the same time we have faced a general downturn in our sales and marketing efforts.

The duration of these measures is unknown, may be extended and additional measures may be imposed. We cannot predict the long-term effects on our business, including our financial position or results of operations, if governmental restrictions or other such directives continue for a prolonged period of time and cause a material negative change in power generation demand, materially disrupt our supply chain, substantially increase our operating costs or limit our ability to serve existing customers and seek new customers.

In response to the COVID-19 outbreak, in March 2020, the federal government passed the Coronavirus Aid, Relief, and Economic Security Act (the "CARES Act"). The CARES Act provided, among other things, the deferral of payroll tax payments for all payroll taxes incurred through December 31, 2020 and created the Paycheck Protection Program ("PPP"), which is sponsored and administered by the SBA. "). In June 2020, the Paycheck Protection Program Flexibility Act of 2020 (the "PPFPA") was signed into law and established the payment dates in the event that amounts borrowed under the PPP are not forgiven. See further discussion below of the loan made to us under the PPP under the section "PPP Loan" under this Item.

The Company elected to defer payments of payroll taxes for the periods allowed under the CARES Act and will repay 50% by December 31, 2021 and 50% by December 31, 2022. As of December 31, 2020, total payroll tax payments deferred under the CARES Act were \$0.4 million.

For the year ended December 31, 2020, we incurred costs of \$0.4 million related to sequestration of certain of our employees at our Red River plant. These costs included hazard pay, lodging and meal expenses for 30 days.

Our customers may also be impacted by COVID-19 pandemic as the utilization of energy has changed. We cannot predict the long-term impact on our customers and the subsequent impact on our business.

Components of Revenue, Expenses and Equity Method Investees

The following briefly describes the components of revenues and expenses as presented in the Consolidated Statements of Operations. Descriptions of the revenue recognition policies are included in Note 1 to the Consolidated Financial Statements included in Item 8 of this Report.

Revenues and cost of revenue

Consumables

We sell AC and proprietary chemical blend technologies for purification of air and water contaminants and other industries. Currently, our products mostly serve coal-fired utilities and other industrial boilers that allow the respective utilities to comply with the regulatory air emissions standards as well as water treatment plants to remove contaminants from the water. Additionally, we sell AC to Cabot and its customers through the Supply Agreement. Revenue is generally recorded upon delivery of our product.

License royalties, related party

We recognize license royalties under the M-45 License, under our M-45 Technology, to Tinnium Group. License royalties are based on a percentage of the per-ton, pre-tax margin, inclusive of depreciation expense and other allocable expenses, as defined in the M-45 License. Because Section 45 tax credits from the production and sale of RC will likely not be available after 2021 and both Tinnium Group and Tinnium Services expect to significantly wind down their operations by the end of 2021, we do not expect to receive license royalties after 2021.

Other Operating Expenses

Payroll and benefits

Payroll and benefits costs include personnel related fringe benefits, sales and administrative staff labor costs and stock compensation expenses. Payroll and benefits costs exclude direct labor included in Cost of revenue.

Legal and professional fees

Legal and professional costs include external legal, audit and consulting expenses.

General and administrative

General and administrative costs include director fees and expenses, bad debt expense, research and development expense and other general costs of conducting business. Research and development costs, net of reimbursements from cost-sharing

arrangements, are charged to expense in the period incurred and are reported in the General and administrative line item in the Consolidated Statements of Operations.

Depreciation, amortization, depletion and accretion

Depreciation and amortization expense consists of depreciation expense related to property, plant and equipment and the amortization of long-lived intangible assets. Depletion and accretion expense consists of depletion expense related to the depletion of mine development costs and the accretion of mine reclamation liabilities.

Other Income (Expense), net

Earnings from equity method investments

Earnings from equity method investments represent our share of earnings (losses) related to our equity method investments.

We own a 42.5% equity interest and a 50% voting interest in Tinum Group. Our equity method earnings in Tinum Group are positively impacted when Tinum Group obtains an investor in a RC facility and receives cash payments under either a lease arrangement or sales arrangement of the RC facility. If Tinum Group operates a retained RC facility, the Company's equity method earnings are negatively impacted as operating retained RC facilities generate operating losses. However, we benefit on an after-tax basis if we are able to utilize tax credits associated with the production and sale of RC from operation of retained RC facilities by Tinum Group. These benefits, if utilized, increase our consolidated net income as a result of a reduction in income tax expense.

We own both a 50% equity and voting interest in Tinum Services, which operates and maintains RC facilities under operating and maintenance agreements. The lessee/owner of an RC facility pays Tinum Services, subject to certain limitations, the costs of operating and maintaining the RC facilities plus certain fees. Tinum Services also arranges for the purchase and delivery of certain chemical additives under chemical agency agreements necessary for the production of RC. Tinum Services consolidates certain RC facilities leased or owned by tax equity investors that are deemed to be variable interest entities ("VIE's"). All net income (loss) associated with these VIE's is allocated to the noncontrolling equity holders of Tinum Services and therefore does not impact our equity earnings (loss) from Tinum Services.

Other income (expense)

The remaining components of other income (expense) include interest income, interest expense and other miscellaneous items.

Results of Operations

For comparison purposes, the following tables set forth our results of operations for the years presented in the Consolidated Financial Statements included in Item 8 of this Report. The year-to-year comparison of financial results is not necessarily indicative of financial results that may be achieved in future years.

Year ended December 31, 2020 Compared to Year ended December 31, 2019

Total Revenue and Cost of Revenue

A summary of the components of revenues and cost of revenue for the years ended December 31, 2020 and 2019 is as follows:

<i>(Amounts in thousands except percentages)</i>	Years Ended December 31,		Change	
	2020	2019	(\$)	(%)
Revenues:				
Consumables	\$ 48,122	\$ 53,187	\$ (5,065)	(10)%
License royalties, related party	13,440	16,899	(3,459)	(20)%
Other	15	—	15	*
Total revenues	\$ 61,577	\$ 70,086	\$ (8,509)	(12)%
Consumables cost of revenue, exclusive of depreciation and amortization	\$ 45,176	\$ 49,443	\$ (4,267)	(9)%
Other cost of revenue, exclusive of depreciation and amortization	(563)	—	(563)	*

* Calculation not meaningful

Consumables revenue and consumables cost of revenue

For the years ended December 31, 2020 and 2019, consumables revenue decreased year over year primarily due to less favorable price and product mix of approximately \$7.6 million combined. Offsetting these decreases was higher volume resulting in revenue of approximately \$2.6 million. However, for the quarterly period ended December 31, 2020, both volumes and revenue increased both sequentially and compared to the quarterly period ended December 31, 2019, primarily due to the Supply Agreement, which was executed on September 30, 2020.

Consumables revenue is affected by electricity demand, driven by seasonal weather and related power generation needs, as well as competitor prices related to alternative power generation sources such as natural gas. According to data provided by the EIA, for the year ended December 31, 2020, power generation from coal-fired power dispatch was down approximately 19.0% compared to the corresponding period in 2019. Additionally, there was a decrease in total power generation from all sources of approximately 4.0% in 2020 compared to the corresponding period in 2019.

Consumables cost of revenue was positively impacted for the year ended December 31, 2020 due to higher volumes driving lower per unit fixed costs. However, we incurred additional expense from safety actions taken by the Company to provide for continued operation of our manufacturing facilities in response to COVID-19 of approximately \$0.4 million. For the year ended December 31, 2019, consumables cost of revenue was negatively impacted as a result of \$5.0 million of costs recognized as a result of the step-up in inventory fair value recorded from the Carbon Solutions Acquisition.

For 2021, based on current market estimates and the expected benefits from the Supply Agreement, we believe that consumables revenue and volumes will be higher for 2021 compared to 2020. In addition to the Supply Agreement, the most significant drivers related to this expected volume increase are expected higher natural gas prices and the expansion of energy generation sources related to natural gas and renewables. For 2021, we expect to incur additional plant costs that were not incurred in 2020 for the planned plant turnaround occurring in 2021.

License royalties, related party

License royalties decreased in 2020 compared to 2019 primarily due to a reduction in the royalty rate per ton. This decrease was primarily attributable to higher depreciation recognized of approximately \$1.7 million on all royalty bearing RC facilities as a result of a reduction in their estimated useful lives as determined by Tinum Group in the second half of 2019. Further reducing the rate per ton was a decrease in net lease payments of approximately \$1.3 million as a result of Tinum Group restructuring RC facility contracted leases with its largest customer in the second half of 2019. As a result of higher depreciation and lower lease payments, we expect that the lower royalty rate per ton will continue in 2021.

Offsetting the year over year decrease in license royalties from a decrease in the royalty rate per ton, there was an increase year over year in tons of RC produced from RC produced using the M-45 Technology under the M-45 License, which increased from 47.3 million tons in 2019 to 49.4 million tons in 2020.

Other cost of revenue

For the year ended December 31, 2020, we recognized a credit of \$0.6 million to Other cost of revenue for the reversal of an allowance, originally recorded as of December 31, 2016, on a trade account receivable due from the Former Customer. We recorded the reversal of this reserve based on our quarterly collectability review of financial assets that was performed as of December 31, 2020. See further discussion below of the reversal of an allowance on a note receivable due from the Former Customer in this section under the caption "General and administrative."

Additional information related to revenue concentrations and contributions by class and reportable segment is included in the "Business Segments" section of this Item and in Note 13 and Note 19 to the Consolidated Financial Statements included in Item 8 of this Report.

Other Operating Expenses

A summary of the components of our operating expenses, exclusive of cost of revenue items (presented above), for the years ended December 31, 2020 and 2019 is as follows:

<i>(in thousands, except percentages)</i>	Years Ended December 31,		Change	
	2020	2019	(\$)	(%)
Operating expenses:				
Payroll and benefits	\$ 10,621	\$ 10,094	\$ 527	5 %
Legal and professional fees	5,585	9,948	(4,363)	(44)%
General and administrative	8,228	8,123	105	1 %
Depreciation, amortization, depletion and accretion	8,537	7,371	1,166	16 %
Impairment of long-lived assets	26,103	—	26,103	*
Gain on settlement	(1,129)	—	(1,129)	*
	<u>\$ 57,945</u>	<u>\$ 35,536</u>	<u>\$ 22,409</u>	63 %

* Calculation not meaningful

Payroll and benefits

Payroll and benefits expenses increased year over year primarily due to severance related costs of \$1.4 million incurred in 2020 associated with the resignation of an executive officer, offset by a decrease in salaries related to our current headcount, which remained relatively consistent year over year.

Legal and professional fees

Legal and professional fees decreased year over year primarily due to decreased outsourced shared service costs, which included legal, general consulting and audit and accounting fees of approximately \$2.8 million, and a reduction in outsourced IT costs specific to the completion of the integration of Carbon Solutions of \$1.5 million.

General and administrative

General and administrative expenses increased year over year primarily due to an increase in product development expenses of approximately \$0.8 million related to the Supply Agreement, an increase in rent and occupancy of approximately \$0.6 million relating to property taxes and office rent, and an increase in costs incurred due to the sequestration of certain of our employees at our Red River plant of approximately \$0.4 million.

Offsetting these increases was the reversal of an allowance on a note receivable from the Former Customer (See "Other cost of revenue" discussion of above under this section) of \$0.4 million, which we reversed as part of our financial asset collectability review performed as of December 31, 2020. See further discussion below in this section under the caption "Gain on settlement." Further reductions year over year included travel, as a preventative measure related to the COVID-19 pandemic, and recruiting fees.

Depreciation, amortization, depletion and accretion

Depreciation and amortization expense increased year over year primarily due to increased sales volumes in 2020 and lower absorption due to the drawdown of inventory, resulting in an increase of depreciation expense of \$1.1 million. Further, the addition of leasehold improvements at our corporate headquarters in 2020 and the addition of accretion expense related to Marshall Mine contributed approximately \$0.7 million of depreciation and amortization expense in 2020. Offsetting these increases was a decrease year over year in depreciation and amortization expense of approximately \$0.6 million related to impaired property, plant and equipment assets as of June 30, 2020, which resulted in lower net book values of the impaired assets of June 30, 2020 and lower depreciation and amortization recorded in the second half of 2020.

Impairment of long-lived assets

As of June 30, 2020, we recorded an impairment charge of \$26.1 million, which is included in the Statement of Operations for the year ended December 31, 2020 and was solely attributable to our APT segment. This impairment charge was necessitated by an analysis of the carrying values of our APT segment's long-lived assets and certain other long-lived assets (the "Asset

Group"), which are comprised of our manufacturing plant and related assets and our lignite mine assets, to their respective fair values.

Gain on settlement

As noted above under this Item 7, for the year ended December 31, 2020, we recognized a gain of \$1.1 million on the Settlement with the Former Customer.

Other Income (Expense), net

A summary of the components of our other income (expense), net for the years ended December 31, 2020 and 2019 is as follows:

<i>(Amounts in thousands, except percentages)</i>	Years Ended December 31,		Change	
	2020	2019	(\$)	(%)
Other income (expense):				
Earnings from equity method investments	\$ 30,978	\$ 69,176	\$ (38,198)	(55)%
Interest expense	(3,920)	(7,174)	3,254	(45)%
Other	132	427	(295)	(69)%
Total other income	\$ 27,190	\$ 62,429	\$ (35,239)	(56)%

Earnings from equity method investments

The following table presents the equity method earnings by investee for the years ended December 31, 2020 and 2019:

<i>(in thousands)</i>	Years Ended December 31,		Change	
	2020	2019	(\$)	(%)
Earnings from Tinum Group	\$ 24,396	\$ 60,286	\$ (35,890)	(60)%
Earnings from Tinum Services	6,582	8,896	(2,314)	(26)%
Earnings (loss) from other	—	(6)	6	(100)%
Earnings from equity method investments	<u>\$ 30,978</u>	<u>\$ 69,176</u>	<u>\$ (38,198)</u>	(55)%

For the year ended December 31, 2020, we recognized \$24.4 million in equity earnings from Tinum Group, which was equal to our proportionate share of Tinum Group's net income for the year. For the year ended December 31, 2019, we recognized \$60.3 million in equity earnings from Tinum Group compared to our proportionate share of Tinum Group's net income of \$62.0 million for the year. This difference was the result of cumulative distributions received from Tinum Group being in excess of the carrying value of the investment, and therefore we recognized such excess distributions as equity method earnings in the year the distributions occurred. See further discussion of year over year changes in Earnings from Equity Investments in "Business Segments" under this Item. Additional information related to equity method investments is included in Note 7 to the Consolidated Financial Statements included in Item 8 of this Report.

Tinum Group's audited consolidated financial statements as of December 31, 2020 and 2019 and for the years then ended are included in Item 15 - "Exhibits and Financial Statement Schedules" ("Item 15") of this Report.

Tax Credits and Obligations

Historically, we have earned Section 45 tax credits that may be available for future benefit related to the production of RC from the operation of RC facilities in which we have held both direct ownership and indirect ownership through Tinum's direct ownership. We refer to these RC facilities as "retained facilities." Future earned Section 45 tax credits for 2021 are expected to be consistent with 2020. As of December 31, 2020, we had approximately \$93.9 million in Section 45 tax carryforwards.

In the hypothetical event of an ownership change, as defined by IRC Section 382, utilization of general business credits ("GBC's") generated prior to the change would be subject to an annual limitation imposed by IRC Section 383 for GBC's. The results of a recent analysis indicated that we had not experienced an ownership change as of December 31, 2020, as defined by IRC Section 382. Such analysis for the period from January 1, 2021 through the date of this Report has not been completed.

Therefore, it is possible that we experienced an ownership change between January 1, 2021 and the date of this filing, thus subjecting our GBC carryforwards to limitation.

Interest expense

Interest expense decreased year over year by \$3.3 million primarily due to a reduction in the coupon interest of \$2.4 million related to senior term loan (the "Senior Term Loan"), as the principal balance was reduced from payments made of \$24.0 million in 2020 and the weighted-average interest rate for 2019 compared to 2020 decreased from 7.1% to 5.8%. Interest expense related to debt discount and debt issuance costs related to the Senior Term Loan also decreased by \$0.3 million as a result of the decrease in the Senior Term Loan principal. The remaining decrease in interest expense year over year related to lower interest expense ("Section 453A interest") in 2020 compared to 2019 related to IRS section 453A ("Section 453A"), which decreased by \$0.7 million in 2020 year over year as a result of a decrease in the tax liability for the year ended December 31, 2020 associated with RC facilities in which Tinum Group recognized as installment sales for tax purposes.

The following table shows the balance of the tax liability that has been deferred and the applicable interest rate used to calculate 453A interest:

<i>(in thousands)</i>	As of December 31,	
	2020	2019
Tax liability deferred on installment sales ⁽¹⁾	\$ 10,653	\$ 20,783
Interest rate	3.00 %	5.00 %

(1) Represents the approximate tax effected liability utilizing the federal tax rate in effect for the applicable years ended related to the deferred gain on installment sales (approximately \$59.8 million as of December 31, 2020).

We expect the tax liability deferred on installment sales to be minimal as of December 31, 2021.

Income tax expense

For the year ended December 31, 2020, our reported income tax expense of \$6.5 million differed from federal income tax benefit of \$2.9 million, computed by applying the U.S. statutory federal income tax rate (the "Federal Rate") and state income tax benefit of \$0.4 million, primarily due to the increase in the valuation allowance on our deferred income tax assets of \$9.1 million.

For the year ended December 31, 2019, our reported income tax expense of \$12.0 million differed from income tax expense of \$10.0 million, computed using the Federal Rate, primarily due to an increase in income tax expense from state income tax expense, net of federal benefit of \$1.6 million.

Accounting for income taxes requires that companies assess whether a valuation allowance should be recorded against their deferred tax asset based on an assessment of the amount of the deferred tax asset that is "more likely than not" to be realized. Valuation allowances are established, when necessary, to reduce deferred tax assets to the amount that is more likely than not to be realized.

We assess the valuation allowance recorded against deferred tax assets at each reporting date. The determination of whether a valuation allowance for deferred tax assets is appropriate requires the evaluation of positive and negative evidence that can be objectively verified. Consideration must be given to all sources of taxable income available to realize the deferred tax asset, including, as applicable, the future reversal of existing temporary differences, future taxable income forecasts exclusive of the reversal of temporary differences and carryforwards, taxable income in carryback years and tax planning strategies. In estimating taxes, we assess the relative merits and risks of the appropriate tax treatment of transactions taking into account statutory, judicial, and regulatory guidance.

As of December 31, 2020, we concluded it is more likely than not we will generate sufficient taxable income within the applicable net operating loss and tax credit carryforward periods to realize \$10.6 million of our net deferred tax assets. In reaching this conclusion, we primarily considered: (1) the future reversal of existing temporary differences; and (2) forecasts of future taxable income. As of December 31, 2020 and 2019, we had a valuation allowance of \$88.8 million and \$79.6 million, respectively, on our deferred tax assets.

The ability to recognize the remaining deferred tax assets that continue to be subject to a valuation allowance is evaluated on a quarterly basis to determine if there are any significant events that would affect the ability to utilize those deferred tax assets.

Our estimate of future taxable income is based on internal projections that consider historical performance, assumptions on future performance and external data. If events are identified that affect our ability to utilize our deferred tax assets, or if additional deferred tax assets are generated, we update our analysis to determine if an increase to the valuation allowance is required. Such an increase could have a material adverse effect on our financial condition and results of operations. Conversely, better than expected results and continued positive results and trends could result in a decrease to the valuation allowance, and any such decreases could have a material positive effect on our financial condition and results of operations.

See additional discussion in Note 18 of the Consolidated Financial Statements included in Item 8 of this Report.

Non-GAAP Financial Measures

To supplement our financial information presented in accordance with GAAP, we are providing non-GAAP measures of certain financial performance. These non-GAAP measures include Consolidated EBITDA, Consolidated Adjusted EBITDA, RC Segment EBITDA, RC Segment Adjusted EBITDA, APT Segment EBITDA and APT Segment Adjusted EBITDA. We have included non-GAAP measures because management believes that they help to facilitate period to period comparisons of our operating results. We believe the non-GAAP measures provide useful information to both management and users of the financial statements by excluding certain expenses, gains and losses that may not be indicative of core operating results and business outlook. Management uses these non-GAAP measures in evaluating the performance of our business.

These non-GAAP measures are not in accordance with, or an alternative to, measures prepared in accordance with GAAP and may be different from non-GAAP measures used by other companies. In addition, these non-GAAP measures are not based on any comprehensive set of accounting rules or principles. These measures should only be used to evaluate our results of operations in conjunction with the corresponding GAAP measures.

We define Consolidated EBITDA as net income adjusted for the impact of the following items that are either non-cash or that we do not consider representative of our ongoing operating performance: depreciation, amortization, depletion, accretion, interest expense, net and income tax expense. We define Consolidated Adjusted EBITDA as Consolidated EBITDA reduced by the non-cash impacts of equity earnings from equity method investments and gain on settlement, and increased by cash distributions from equity method investments, impairment of long-lived assets and amortization of upfront customer consideration that was recorded as a component of the Marshall Mine Acquisition ("Upfront Customer Consideration"). Because Consolidated Adjusted EBITDA omits certain non-cash items, we believe that the measure is less susceptible to variances that affect our operating performance.

We define APT Segment EBITDA Loss as APT Segment operating loss adjusted for the impact of the following items that are either non-cash or that we do not consider representative of our ongoing operating performance: depreciation, amortization, depletion, accretion and interest expense, net. We define APT Segment Adjusted EBITDA loss as APT Segment EBITDA loss reduced by gain on settlement and increased by impairment of long-lived assets and amortization of Upfront Customer Consideration.

We define RC Segment EBITDA as RC Segment operating income adjusted for the impact of the following items that are either non-cash or that we do not consider representative of our ongoing operating performance: depreciation, amortization, depletion, accretion and interest expense. We define RC Segment Adjusted EBITDA as RC Segment EBITDA reduced by the non-cash impact of equity earnings from equity method investments and increased by cash distributions from equity method investments.

When used in conjunction with GAAP financial measures, we believe these non-GAAP measures are supplemental measures of operating performance that explain our operating performance for our period to period comparisons and against our competitors' performance. Generally, we believe these non-GAAP measures are less susceptible to variances that affect our operating performance results.

With the exception of impairment on long-lived assets and gain on settlement, the adjustments to Consolidated Adjusted EBITDA and APT Segment Adjusted EBITDA in future periods are generally expected to be similar. These non-GAAP measures have limitations as analytical tools, and should not be considered in isolation or as a substitute for analyzing our results as reported under GAAP.

Consolidated EBITDA and Consolidated Adjusted EBITDA

	Year ended December 31,	
	2020	2019
Net (loss) income ⁽¹⁾	\$ (20,302)	\$ 35,537
Depreciation, amortization, depletion and accretion	8,537	7,371
Interest expense, net	3,793	6,913
Income tax expense	6,511	11,999
Consolidated EBITDA (loss)	(1,461)	61,820
Cash distributions from equity method investees	62,441	73,888
Equity earnings	(30,978)	(69,176)
Impairment	26,103	—
Gain on settlement	(1,129)	—
Amortization of Upfront Customer Consideration	158	—
Consolidated Adjusted EBITDA	\$ 55,134	\$ 66,532

(1) Net income for the year ended December 31, 2019 was inclusive of a \$5.0 million adjustment, which increased cost of revenue due to a step-up in basis of inventory acquired related to the Carbon Solutions Acquisition.

Business Segments

As of December 31, 2020, we have two reportable segments, RC and APT.

The business segment measurements provided to and evaluated by our chief operating decision maker are computed in accordance with the principles listed below:

- The accounting policies of the operating segments are the same as those described in the summary of significant accounting policies except as described below.
- Segment revenues include equity method earnings and losses from our equity method investments.
- Segment operating income (loss) includes segment revenues, gains related to sales of equity method investments and allocation of certain "Corporate general and administrative expenses," which include Payroll and benefits, Legal and professional fees, General and administrative, and Depreciation, amortization, depletion and accretion.
- RC segment operating income includes interest expense directly attributable to the RC segment.

The principal products and services of our segments are described in Item 1 of this document. The following table presents our operating segment results for the years ended December 31, 2020 and 2019:

<i>(in thousands)</i>	Years Ended December 31,		Change
	2020	2019	(\$)
Revenues:			
Refined Coal:			
Earnings in equity method investments	\$ 30,978	\$ 69,176	\$ (38,198)
License royalties, related party	13,440	16,899	(3,459)
	44,418	86,075	(41,657)
Advanced Purification Technologies:			
Consumables	48,122	53,187	(5,065)
Other	15	—	15
	48,137	53,187	(5,050)
Total segment reporting revenues	92,555	139,262	(46,707)
Adjustments to reconcile to reported revenues:			
Earnings in equity method investments	(30,978)	(69,176)	38,198
Total reported revenues	\$ 61,577	\$ 70,086	\$ (8,509)
Segment operating income (loss)			
Refined Coal ⁽¹⁾	\$ 42,689	\$ 83,471	\$ (40,782)
Advanced Purification Technologies ⁽²⁾	(39,958)	(13,600)	(26,358)
Total segment operating income	\$ 2,731	\$ 69,871	\$ (67,140)

(1) Included in the RC segment operating income for the years ended December 31, 2020 and 2019 is 453A interest expense of \$0.3 million and \$1.0 million, respectively.

(2) Included in the APT segment operating loss for the years ended December 31, 2020 and 2019 was \$7.9 million and \$7.2 million, respectively, of depreciation, amortization, depletion and accretion expenses on mine- and plant-related long-lived assets and liabilities. Included in the APT segment operating loss for the year ended December 31, 2020 was an impairment charge of \$26.1 million offset by gain on settlement of \$1.1 million. Included in the APT segment operating loss for the year ended December 31, 2019 was approximately \$5.0 million of cost of revenue expense related to a step up in basis of the fair value of inventory and of depreciation, amortization.

A reconciliation of segment operating income to consolidated net income is included in Note 19 of the Consolidated Financial Statements included in Item 8 of this Report.

Refined Coal

The following table details the segment revenues of our respective equity method investments for the years ended December 31, 2020 and 2019:

<i>(in thousands)</i>	Year ended December 31,	
	2020	2019
Earnings from Tinum Group	\$ 24,396	\$ 60,286
Earnings from Tinum Services	6,582	8,896
Earnings (loss) from other	—	(6)
Earnings from equity method investments	\$ 30,978	\$ 69,176

For 2020, equity earnings from Tinum Group were positively impacted by the addition of two new RC facilities during the second half of 2019, three new RC facilities added during the year ended December 31, 2020 and the sale by Tinum Group of its 49.9% remaining interest in an RC facility in the quarterly period ended September 30, 2020. However, equity earnings from Tinum Group for 2020 decreased from 2019 primarily from the point-in-time revenue recognition in 2019 of two new RC facilities and due to higher depreciation recognized of approximately \$4.9 million in 2020 on all Tinum Group RC facilities as

a result of a reduction in RC facilities estimated useful lives as determined by Tinum Group during the second half of 2019. Further contributing to the decrease in equity earnings for 2020 compared to 2019 was the restructuring of RC facility leases with Tinum Group's largest customer in 2019, which decreased lease payments and equity earnings beginning in the second half of 2019, and the termination of two RC facility leases in the fourth quarter of 2019 for RC facilities located at two coal-fired utilities that were announced for closure in 2019. Also, in the fourth quarter of 2020, Tinum Group recorded an impairment charge of \$3.0 million on certain of its assets located at RC facilities and a retention accrual related to the wind down of its operations by the end of 2021.

As a result of higher depreciation, lower lease payments and the termination of RC facilities' leases throughout 2021 due to the expiration of the Section 45 tax period applicable to those RC facilities' leases, we expect our earnings in Tinum Group to decrease in 2021. However, in 2021, and consistent with 2020, we expect that cash distributions will substantially exceed earnings.

RC earnings related to M-45 license royalties decreased from 2020 to 2019 as a result of reduction in the royalty rate per ton year over year offset by an increase in tonnage produced by RC facilities subject to the M-45 License.

Equity earnings from Tinum Services decreased by \$2.3 million in 2020 compared to 2019 primarily as a result of recording an impairment charge of \$2.9 million for year ended December 31, 2020 as well as a reduction in tonnage for the RC facilities that Tinum Services operated in 2020 compared to 2019. As of December 31, 2020 and 2019, Tinum Services provided operating and maintenance services to 22 and 19 RC facilities, respectively. Tinum Services derives earnings from both fixed-fee arrangements as well as fees that are tied to actual RC production, as determined by the specific RC facility operating and maintenance agreement.

Outlook

Both Tinum Group and Tinum Services expect to significantly wind down their operations by the end of 2021 due to the planned expiration of the Section 45 tax credit period as of December 31, 2021, and the loss of equity earnings, distributions and M-45 Royalties beginning in 2022 will have a material adverse effect on our financial condition and consolidated operating results compared to historical periods. Earnings in the RC segment for 2021 will continue to be impacted by coal-fired dispatch and invested facilities with leases subject to periodic renewals being terminated, repriced, or otherwise subject to renegotiated terms. As a result of higher depreciation and lower lease payments for 2021, as well as the expiration of the Section 45 tax program as of December 31, 2021, we expect our earnings in Tinum Group to decrease in 2021. However, in 2021, and consistent with 2020, cash distributions will substantially exceed earnings.

RC Segment EBITDA and Adjusted EBITDA

<i>(in thousands)</i>	Year ended December 31,	
	2020	2019
RC Segment operating income	\$ 42,689	\$ 83,471
Depreciation, amortization, depletion and accretion	116	83
Interest expense	331	1,039
RC Segment EBITDA	43,136	84,593
Cash distributions from equity method investees	62,441	73,888
Equity earnings	(30,978)	(69,176)
RC Segment Adjusted EBITDA	\$ 74,599	\$ 89,305

Advanced Purification Technologies

APT segment operating loss increased during the year ended December 31, 2020 compared to 2019 primarily due to the impairment charge of \$26.1 million, a reduction in consumable revenue and associated margins and costs incurred related to COVID-19. During the year ended December 31, 2020, Consumables revenue and margins also continued to be negatively impacted by low coal-fired power dispatch driven by power generation from sources other than coal and a decline in overall U.S. power generation during 2020 of approximately 4.0%.

During the year ended December 31, 2020, we incurred costs of \$0.4 million related to sequestration of certain of our employees at our Red River plant. These costs included hazardous pay, lodging expense and other related costs for 60 days.

Outlook

Based on current market estimates, we believe that the APT segment will continue to be negatively impacted, as power generation from coal-fired power plants declines and the market focuses on other sources, including natural gas and renewable energy. Future demand will also be impacted by prices of competing energy sources such as natural gas. Low prices of alternative energy sources and decreasing power generation from coal-fired utilities reduce demand for our products. However, in 2021 and beyond, we expect the Supply Agreement to play significant roles in diversifying our product mix into markets outside of power generation.

APT Segment EBITDA Loss and Adjusted EBITDA Loss

<i>(in thousands)</i>	Year ended December 31,	
	2020	2019
APT Segment operating loss ⁽¹⁾	\$ (39,958)	\$ (13,600)
Depreciation, amortization, depletion and accretion	7,870	7,206
Interest expense, net	402	368
APT Segment EBITDA loss	(31,686)	(6,026)
Impairment	26,103	—
Gain on settlement	(1,129)	—
Amortization of Upfront Customer Consideration	158	—
APT Segment Adjusted EBITDA loss	<u>\$ (6,554)</u>	<u>\$ (6,026)</u>

(1) Segment operating loss for the year ended December 31, 2019 was inclusive of an adjustment of \$5.0 million, which increased cost of revenue due to a step-up in basis of inventory acquired related to the Carbon Solutions Acquisition.

Liquidity and Capital Resources

Factors Affecting Our Liquidity

During 2020, our liquidity position was positively affected primarily from cash distributions from Tinum Group and Tinum Services, royalty payments from Tinum Group, PPP Loan distributions and borrowing availability under our bank ("Lender") line of credit (the "Line of Credit").

As of December 31, 2020, our principal future sources of liquidity include:

- cash and cash equivalents;
- distributions from Tinum Group and Tinum Services;
- royalty payments from Tinum Group;
- operations of the APT segment; and
- the Line of Credit.

For the year ended December 31, 2020, our principal uses of liquidity included:

- our business operating expenses, including capital expenditures, reclamation costs, federal and state tax payments and cash severance payments,
- payment of debt principal and interest;
- payment of dividends; and
- repurchases of shares of common stock.

Tinum Group and Tinum Services Distributions

The following table summarizes the cash distributions from our equity method investments, which most significantly affected our consolidated cash flow results, for the years ended December 31, 2020 and 2019:

<i>(in thousands)</i>	Year ended December 31,	
	2020	2019
Tinum Group	\$ 53,289	\$ 65,238
Tinum Services	9,152	8,650
Distributions from equity method investees	<u>\$ 62,441</u>	<u>\$ 73,888</u>

Cash distributions from Tinum Group for 2020 decreased by \$11.9 million compared to 2019 primarily due to reductions in lease payments received by Tinum Group from its largest customer as a result of renegotiations of certain leases, which occurred in the second half of 2019 between Tinum Group and this customer, and the shuttering of two coal-fired utilities in the fourth quarter of 2019 where two invested RC facilities were operating.

Future cash flows from Tinum are expected to range from \$70 to \$90 million, and key drivers in achieving these future cash flows are based on the following:

- 23 invested facilities as of December 31, 2020 and inclusive of all net Tinum cash flows (distributions and license royalties), offset by estimated federal and state income tax payments and 453A interest payments.

Expected future cash flows from Tinum Group are based on the following key assumptions:

- Tinum Group continues to not operate retained facilities;
- Tinum Group does not have material unexpected capital expenditures or unusual operating expenses;
- Tax equity lease renewals on invested facilities are not terminated or repriced; and
- Coal-fired power generation remains consistent with existing contractual expectations.

Both Tinum Group and Tinum Services expect to significantly wind down their operations by the end of 2021 due to the expected expiration of the Section 45 tax credit period as of December 31, 2021. As such, our distributions from our RC segment will substantially cease as of December 31, 2021.

PPP Loan

On April 20, 2020, we entered into the PPP Loan under the PPP, evidenced by a promissory note, with BOK providing for \$3.3 million in proceeds, which was funded on April 21, 2020. The PPP Loan matures April 21, 2022. The PPP Loan principal may be forgiven subject to the terms of the PPP and approval by the SBA. The interest rate on the PPP Loan is 1.00%. The PPP Loan is unsecured and contains customary events of default relating to, among other things, payment defaults, making materially false and misleading representations to the SBA or BOK, or breaching the terms of the PPP Loan. The occurrence of an event of default may result in the repayment of all amounts outstanding, collection of all amounts owing from us, or filing suit and obtaining judgment against us.

Under the PPPFA, as defined above, monthly payments of principal and interest commence on the later of 10 months following the "covered period" (as defined in the PPPFA) or the date that BOK notifies us that the SBA has notified BOK that all or a portion of the PPP Loan has not been forgiven. In January 2021, we submitted an application to the SBA for forgiveness of the PPP Loan and we are awaiting the SBA's response on our application for forgiveness. Accordingly, we have determined that any amounts due under the PPP Loan would commence in August 2021.

Our business has been classified as an essential business, and therefore we continue to operate on a modified basis to comply with governmental restrictions and public health authority guidelines. In April 2020, we sequestered approximately 60 employees to continue to run our manufacturing plant and build-up inventory in order to supply our customers. This resulted in additional costs as the sequestered employees received hazard pay. We used proceeds from the PPP Loan to fund our payroll costs.

Restricted Cash

As of December 31, 2020, we had short-term restricted cash of \$5.0 million as required under a minimum cash balance requirement of a Senior Term Loan covenant, and long-term restricted cash of \$5.0 million as required under the Surety Agreement related to the Reclamation Contract. Under the Surety Agreement, we are required to increase the restricted cash balance by \$5.0 million as of March 31, 2021.

Senior Term Loan

On December 7, 2018, we executed the Senior Term Loan with Apollo in the principal amount of \$70.0 million, less original issue discount of \$2.1 million. We also paid debt issuance costs of \$2.0 million related to the Senior Term Loan. The Senior Term Loan matures on December 7, 2021 and bears interest at a rate equal to 3-month LIBOR (subject to a 1.5% floor) + 4.75% per annum, which is adjusted quarterly to the current 3-month LIBOR rate, and interest is payable quarterly in arrears. As of December 31, 2020, we have \$16.0 million in outstanding principal which, per the contractual requirements, we expect to fully repay in 2021. The Senior Term Loan is secured by substantially all of our assets, including the cash flows from Tinum Group and Tinum Services, but excluding our equity interests in those Tinum entities.

The Senior Term Loan includes, among others, the following covenants: (1) As of the end of each fiscal quarter, we must maintain a minimum cash balance of \$5.0 million and shall not permit "expected future net cash flows from the refined coal business" (as defined in the Senior Term Loan) to be less than 1.75 times the outstanding principal amount of the Senior Term Loan; (2) Annual collective dividends and buybacks of shares of our common stock in an aggregate amount, not to exceed \$30.0 million, are permitted so long as (a) no default or event of default exists under the Senior Term Loan and (b) expected future net cash flows from the refined coal business as of the end of the most recent fiscal quarter exceed \$100.0 million. As of December 31, 2020, our expected future net cash flows from the refined coal business are less than \$100.0 million and we have no plans in 2021 to either declare cash dividends on our stock or repurchase shares of our common stock. See also "Item 1A Risk Factors" of this Report - "Risks relating to our common stock - There can be no assurance that we will continue to declare cash dividends at all or in any particular amounts."

Stock Repurchases and Dividends

In November 2018, our Board authorized us to purchase up to \$20.0 million of our outstanding common stock under a stock repurchase program (the "Stock Repurchase Program"), which was to remain in effect until December 31, 2019 unless otherwise modified by the Board. As of November 2019, \$2.9 million remained outstanding related to Stock Repurchase Program. In November 2019, the Board authorized an incremental \$7.1 million to the Stock Repurchase Program and provided that it will remain in effect until all amounts are utilized or it is otherwise modified by the Board.

During the year ended December 31, 2020, we paid quarterly cash dividends to stockholders of \$4.6 million, which was paid on March 10, 2020.

Line of Credit

As of December 31, 2020, there were no outstanding borrowings under the Line of Credit.

In September 2013, ADA, as borrower, ADES, as guarantor, and the Lender entered into the Line of Credit for an aggregate principal amount of \$10.0 million that was secured by certain amounts due to the Company from certain Tinum Group RC leases. The Line of Credit has been amended 14 times from the period from December 2, 2013 through December 31, 2020, which included a reduction in the principal amount to \$5.0 million in September 2018.

On September 29, 2020, ADA, ADES and the Lender entered into an amendment to the Line of Credit (the "Fourteenth Amendment"), which extended the maturity date of the Line of Credit to March 31, 2021. In addition, the Fourteenth Amendment retained covenants from the prior amendments to the Line of Credit, which included ADA's ability to enter into the Senior Term Loan as a guarantor so long as the principal amount of the Senior Term Loan did not exceed \$70.0 million and the revision of covenants that were consistent with the Senior Term Loan covenants, including maintaining a minimum cash balance of \$5.0 million.

Cash Flows

Cash, cash equivalents and restricted cash increased from \$17.1 million as of December 31, 2019 to \$35.9 million as of December 31, 2020, an increase of \$18.9 million. The following table summarizes our cash flows for the years ended December 31, 2020 and 2019, respectively:

(in thousands)	Years Ended December 31,		
	2020	2019	Change
Cash provided by (used in):			
Operating activities	\$ 54,469	\$ 62,262	\$ (7,793)
Investing activities	(7,887)	(13,238)	5,351
Financing activities	(27,730)	(55,716)	27,986
Net change in Cash and Cash Equivalents and Restricted Cash	<u>\$ 18,852</u>	<u>\$ (6,692)</u>	<u>\$ 25,544</u>

Cash flows from operating activities

Cash flows provided by operating activities for the year ended December 31, 2020 decreased by \$7.8 million compared to the year ended December 31, 2019 and were negatively impacted primarily by the following: (1) a decrease in Distributions from equity method investees, return on investment of \$11.4 million; (2) a decrease of \$5.2 million in deferred income tax expense; and (3) a reduction due to the Gain on settlement of \$1.1 million recognized in 2020. Offsetting these decreases to operating cash flows was primarily a decrease in earnings from equity method investments of \$38.2 million and Impairment of long-lived assets of \$26.1 million recorded in 2020.

Cash flows from investing activities

Cash flows used in investing activities for the year ended December 31, 2020 decreased by \$5.4 million compared to the year ended December 31, 2019 primarily due to a decrease in expenditures for mine development costs of \$3.5 million. Also contributing to the decrease in cash flows used in investing activities were decreases in cash flows used in investing activities for acquisition of property, plant, equipment and intangibles of \$1.2 million and the final cash payment for the Carbon Solutions Acquisition of \$0.7 million, which was made in 2019.

Cash flows from financing activities

Cash flows used in financing activities for the year ended December 31, 2020 were \$27.7 million compared to cash flows provided by financing activities of \$55.7 million for the year ended December 31, 2019. This net decrease in cash flows used in financing activities was primarily due a decrease in dividends paid and shares repurchased of \$13.3 million and \$5.6 million, respectively, in an effort to preserve cash due to uncertainties arising from the COVID-19 pandemic in 2020. Also contributing to the decrease were lower principal payments on the Senior Term Loan of \$6.0 million and \$3.3 million of cash proceeds in 2020 from the PPP Loan .

Liquidity Outlook

Our ability to continue to generate sufficient cash flow required to meet ongoing operational needs and obligations, and make potential future dividend payments and share repurchases depends upon several factors, includes executing on our contracts and initiatives, receiving royalty payments from Tinum Group and distributions from Tinum Group and Tinum Services, and increasing our share of the market for APT consumables, including expanding our overall AC business into additional adjacent markets.

Our liquidity was negatively impacted from COVID-19 due to increased operating losses in our APT segment from higher operating costs as a result of measures taken to support our ability to deliver as a critical infrastructure business, primarily from sequestration efforts and "hazard pay," which is a premium on wages, for a substantial number of our employees, and overall plant operating inefficiencies. However, in April 2020, we took steps to enhance our short-term liquidity through the PPP Loan as discussed above under this Item.

In 2021, our primary source of liquidity is expected to be distributions from Tinum Group and Tinum Services. These distributions in 2021 will provide sufficient cash on hand to fund operations in 2021 and 2022. For 2021, we expect to spend \$9.5 million in capital expenditures compared to \$7.1 million incurred in 2020. This increase is primarily the result of product specific capital related to the Supply Agreement and routine scheduled maintenance outages planned for 2021.

Due to the expiration of the Section 45 tax period as of December 31, 2021 and the resultant wind down of Tinum Group's and Tinum Services' operations by the end of 2021, distributions from Tinum Group will no longer be a source of liquidity after 2021.

As we look to 2022 and beyond, our primary source of liquidity is expected to be through our ongoing operations from our APT segment. We believe the Supply Agreement will provide material incremental volume and capture lower operating cost efficiencies of our Red River plant, providing additional sources of operating cash flows in the future. Full and partial reimbursements on capital expenditures from Cabot will help limit our uses of investing cash flows. Further, we intend to fund the remaining portion of the Reclamation Costs from cash on hand as well as cash generated from the Supply Agreement. In 2022 and beyond, our capital expenditures are expected to average approximately \$5.0 million.

Contractual Obligations

Our contractual obligations as of December 31, 2020 are as follows:

(in thousands)	Payment Due by Period				
	Total	Less than 1 year	1-3 years	4-5 years	After 5 years
Senior Term Note ⁽¹⁾	\$ 16,000	\$ 16,000	\$ —	\$ —	\$ —
Finance lease obligations	6,344	1,859	1,988	2,497	—
Operating lease obligations	3,119	1,994	1,125	—	—
Reclamation liability, Marshall Mine ⁽²⁾	20,281	10,257	8,122	1,109	793
	<u>\$ 45,744</u>	<u>\$ 30,110</u>	<u>\$ 11,235</u>	<u>\$ 3,606</u>	<u>\$ 793</u>

(1) Includes outstanding principal amounts due through the maturity date of the Senior Term Loan.

(2) Includes payments due under a capped fee contract with a third-party mining operator for reclamation of the Marshall Mine (the "Marshall Mine ARO"). Payments on this contract are due through approximately 2031. Reclamation costs related to the Marshall Mine ARO are based on a stated fee by month structure, based on the initial estimate of the total costs of reclamation, which provides for certain contingencies that could increase or decrease the reclamation fee over time. The timing of payments may vary, and the Company accounts for these timing differences in valuing the reclamation on a quarterly basis. As well, the Company accounts for changes in actual reclamation costs on a quarterly basis.

The table above excludes obligations related to 453A interest payments, which are variable due to annual changes in the statutory rate established by the IRS and changes in Tinuum Group's deferred tax liabilities associated with taxes that have been deferred under the installment method for sales or leases of certain of Tinuum Group's RC facilities. We do not expect that our obligations for 453A interest will be material for 2021. During 2021, Tinuum Group will be likely closing RC facilities commensurate with the expiration of the Section 45 tax credit period, which expires 10 years after a respective facility was in service and eligible to generate Section 45 tax credits. As a result, Tinuum Group's composite deferred tax liability will decline through 2021 and our 453A interest payments will also decline in proportion to the decrease in Tinuum Group's deferred tax liability.

The table above also excludes our asset retirement obligation ("ARO") related to reclamation of the Five Forks Mine (the "Five Forks ARO"). As of December 31, 2020, our consolidated balance sheet reflects a liability of \$3.3 million for the Five Forks ARO. The Five Forks Mine ARO was recorded at fair value. The timing and amount of payments to satisfy the Five Forks ARO are uncertain and are based on numerous factors including, but not limited to, the Five Forks Mine closure date.

We had no outstanding letters of credit as of December 31, 2020.

Off-Balance Sheet Arrangements

Surety Bonds

As of December 31, 2020, we had outstanding surety bonds of \$36.7 million related to performance requirements under reclamation contracts associated with both the Five Forks Mine and the Marshall Mine. As of December 31, 2020, we had restricted cash of \$5.0 million securing the Surety Agreement and will be required to post an additional \$5.0 million of restricted cash on March 31, 2021. We expect that the obligations secured by these surety bonds will be performed in the ordinary course of business and in accordance with the applicable contractual terms. To the extent that the obligations are performed, the related surety bonds should be released, and we should not have any continuing obligations. However, in the event any surety bond is called, our indemnity obligations could require us to reimburse the issuer of the surety bond.

Critical Accounting Policies and Estimates

Our significant accounting policies are discussed in Note 1 to the Consolidated Financial Statements included in Item 8 of this Report. In presenting our financial statements in conformity with GAAP, we are required to make estimates and assumptions that affect the amounts reported therein. Several of the estimates and assumptions we are required to make relate to matters that are inherently uncertain as they pertain to future events. Our estimates are based on historical experience and other assumptions believed to be reasonable under the circumstances, and we evaluate these estimates on an ongoing basis. Actual results may differ from these estimates under different assumptions or conditions.

We believe that the accounting estimates discussed below are critical to understanding our historical and future performance, as these estimates relate to the more significant areas involving management's judgments and estimates.

Business Combinations, including asset acquisitions

We allocate the purchase price of acquired companies to the tangible and intangible assets acquired and liabilities assumed based on their estimated fair values at the acquisition date. This also includes accounting for asset acquisitions. The purchase price allocation process requires us to make significant estimates and assumptions with respect to assets acquired and liabilities assumed. Although we believe the assumptions and estimates we have made are reasonable, they are based in part on historical experience, market conditions and information obtained from management of the acquired company or group of assets and are inherently uncertain. Examples of critical estimates in valuing certain of the intangible assets we have acquired or may acquire in the future include but are not limited to:

- future expected cash flows from revenues;
- historical and expected customer attrition rates and anticipated growth in revenues from acquired customers;
- the acquired company's developed technology as well as assumptions about the period of time the acquired developed technology will continue to be used in the combined company's product portfolio;
- the expected use and useful lives of the acquired assets; and
- valuation methods and discount rates used in estimating the values of the assets acquired and liabilities assumed.

In regard to the Marshall Mine Acquisition, which was accounted for as an asset acquisition, we recorded the fair value of assumed assets, which included property, plant and equipment and spare parts and assumed liabilities, which included accrued liabilities. In addition, we recorded assets including, Upfront Customer Consideration and the Cabot Receivable, and liability of Marshall Mine ARO.

Carrying value of long-lived assets and intangibles

We review and evaluate our long-lived assets and intangibles for impairment at least annually, or more frequently when events or changes in circumstances indicate that the related carrying amounts may not be recoverable. An impairment loss is measured and recorded for long-lived assets and intangibles based on the excess of their carrying amounts over their estimated fair values. Fair value is typically determined through the use of an income approach utilizing estimates of discounted pre-tax future cash flows or a market approach utilizing recent transaction activity for comparable properties.

Asset Retirement Obligations

Accounting for AROs requires management to make estimates of future costs unique to a specific mining operation that we will incur to complete the reclamation and remediation work required to comply with existing laws and regulations. Any such changes in future costs, the timing of reclamation activities, scope, or the exclusion of certain costs not considered reclamation and remediation costs, could materially impact the amounts charged to earnings for reclamation and remediation. Additionally, future changes to environmental laws and regulations could increase the extent of reclamation and remediation work required.

Five Forks Mine ARO - Reclamation costs related to the Five Forks Mine ARO are allocated to expense over the life of the related mine assets, and are periodically adjusted to reflect changes in the estimated present value resulting from the passage of time and revisions to the estimates of either the timing or amount of the reclamation costs. Remediation costs for the Five Forks Mine are accrued based on management's best estimate at the end of each period of the costs expected to be incurred. Such cost estimates may include ongoing care, maintenance and monitoring costs. Reclamation obligations are based on the timing of estimated spending for an existing environmental disturbance. We review, on at least an annual basis, the Five Forks Mine ARO.

Marshall Mine ARO - Reclamation costs related to the Marshall Mine are based on a capped fee structure, based on the initial estimate of the total costs of reclamation, which provides for certain contingencies that could increase or decrease the reclamation fee based on the reclamation agreement executed between us and the Marshall Mine operator. The timing of payments may vary, and the Company accounts for these timing differences in valuing the reclamation on a quarterly basis. As well, the Company accounts for changes in actual reclamation costs on a quarterly basis.

Income Taxes

We account for income taxes as required by U.S. GAAP, under which management judgment is required in determining income tax expense and the related balance sheet amounts. This judgment includes estimating and analyzing historical and projected future operating results, the reversal of taxable temporary differences, tax planning strategies, and the ultimate outcome of uncertain income tax positions. Actual income taxes paid may vary from estimates, depending upon changes in income tax laws, actual results of operations, and the final audit of tax returns by taxing authorities. Tax assessments may arise several years after tax returns have been filed. Changes in the estimates and assumptions used for calculating income tax expense and potential differences in actual results from estimates could have a material impact on our results of operations and financial condition.

We recognize deferred tax assets to the extent that we believe these assets are more likely than not to be realized. In making such a determination, we consider all available positive and negative evidence, including future reversals of existing taxable temporary differences, projected future taxable income, tax-planning strategies and results of recent operations.

We establish a valuation allowance against our deferred tax assets when, based upon the weight of all available evidence, we believe it is more likely than not that some portion or all of the deferred tax assets will not be realized. As of December 31, 2020 and 2019, we have established valuation allowances for our deferred tax assets that, in our judgment, will not be realized. In making this determination, we have considered the relative impact of all of the available positive and negative evidence regarding future sources of taxable income and tax planning strategies. However, there could be a material impact to our effective tax rate if there is a significant change in our estimates of future taxable income and tax planning strategies. If and when our estimates change, or there is a change in the gross balance of deferred tax assets or liabilities causing the need to reassess the realizability of deferred tax assets, we adjust the valuation allowance through the provision for income taxes in the period in which this determination is made. Refer to Note 18 of our Consolidated Financial Statements included in Item 8 of this Report for additional information regarding our net deferred tax assets and related deferred income tax expense (benefit).

Recently Issued Accounting Standards

Refer to Note 1 of the Consolidated Financial Statements included in Item 8 of this Report for information regarding recently issued accounting standards.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

The information under this Item is not required to be provided by smaller reporting companies.

Item 8. Financial Statements and Supplementary Data

Advanced Emissions Solutions, Inc.

Index to Financial Statements

Advanced Emissions Solutions, Inc.

Consolidated Financial Statements:

<u>Report of Independent Registered Public Accounting Firm</u>	<u>50</u>
<u>Consolidated Balance Sheets as of December 31, 2020 and 2019</u>	<u>53</u>
<u>Consolidated Statements of Operations for the years ended December 31, 2020 and 2019</u>	<u>54</u>
<u>Consolidated Statements of Changes in Stockholders' Equity for the years ended December 31, 2020 and 2019</u>	<u>55</u>
<u>Consolidated Statements of Cash Flows for the years ended December 31, 2020 and 2019</u>	<u>56</u>
<u>Notes to Consolidated Financial Statements</u>	<u>58</u>

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of
Advanced Emissions Solutions, Inc. and Subsidiaries

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Advanced Emissions Solutions, Inc. and subsidiaries (the Company) as of December 31, 2020 and 2019, the related consolidated statements of operations, changes in stockholders' equity and cash flows for the years then ended, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Company as of December 31, 2020 and 2019, and the consolidated 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 consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated 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 consolidated 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 consolidated financial statements, whether due to error or fraud, and performing procedures to respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated 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 consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (1) relate to accounts or disclosures that are material to the consolidated 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 consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing a separate opinion on the critical audit matters or on the accounts or disclosures to which they relate.

Income Taxes – Realizability of Deferred Tax Assets

As described in Notes 1 and 18 to the consolidated financial statements, the Company recognizes deferred income taxes for the effects of temporary differences between the tax basis of an asset or liability and their reported amounts in the accompanying consolidated balance sheet. These temporary differences result in taxable or deductible amounts in future years. Valuation allowances are established, when necessary, to reduce deferred tax assets to the amount that is more likely than not to be realized. As of December 31, 2020 the Company concluded it is more likely than not the Company will generate sufficient taxable income within the applicable net operating loss and tax credit carry-forward periods to realize \$10.6 million of its net deferred tax assets, which resulted in a valuation allowance of \$88.8 million.

We identified the realizability of deferred tax assets as a critical audit matter due to the Company's tax structure and the significant judgments and estimates made by management to determine that sufficient taxable income will be generated to realize a portion of deferred tax assets prior to expiration. This required a high degree of auditor judgment and an increased extent of effort when performing audit procedures to evaluate management's estimates of taxable income prior to expiration.

The primary procedures we performed to address this critical audit matter included:

- Recalculating the mathematical accuracy of management's accounting for the previously described taxes, which included supporting calculations, schedules, and reconciliations.
- Reading and evaluating management's documentation of the accounting for income taxes, including relevant significant accounting policies, and information obtained by management from third party tax specialists which details management's basis for the accounting and impact to the consolidated financial statements.
- Obtaining and evaluating the supporting tax analyses and documentation prepared by management, as a framework and initial support for audit procedures. This includes the Company's deferred tax calculations, which also integrates management's analysis of valuation allowances, current tax expenses (benefits), and IRC Section 45 credits.
- Consulting with internal tax specialists in evaluating management's calculation of its provision for income taxes and that the significant judgments used were applied consistently with the tax code.
- Validating the parameters employed by management in their analysis of the partial valuation allowance, in order to gain comfort with relevant positive and negative evidence available and utilized in performing the analysis.
- Evaluating whether significant estimates and judgments used were consistent with past performance related to said estimates, the consistency of future forecasts and projections based on current operating conditions and future expectations, and that all were consistent with evidence obtained in procedures performed in other areas of the audit.

Accounting for Cabot Transactions

As described in Notes 2, 3, and 4 to the consolidated financial statements, on September 30, 2020, the Company entered into a supply agreement (the Supply Agreement) with Cabot Norit Americas, Inc. (Cabot) to sell and deliver certain lignite-based AC products. Concurrently with the execution of the Supply Agreement, the Company entered into an agreement to purchase (the Mine Purchase Agreement) from Cabot 100% of the membership interests in Marshall Mine, LLC for a nominal purchase price. Marshall Mine, LLC owns a lignite mine located outside of Marshall, Texas (the Marshall Mine). The Company independently determined to immediately commence activities to shutter the Marshall Mine and will incur the associated reclamation costs. In conjunction with the execution of the Supply Agreement and the Purchase Agreement, the Company entered into a reclamation contract (the Reclamation Contract) with a third party that provides a capped cost, subject to certain contingencies, in the amount of approximately \$19.7 million plus an obligation to pay certain direct costs of approximately \$3.6 million (collectively, the Reclamation Costs) over the estimated reclamation period of 10 years. Under the terms of the Supply Agreement, Cabot is obligated to reimburse the Company for \$10.2 million of the Reclamation Costs (the Reclamation Reimbursements). In connection with the Supply Agreement, Purchase Agreement, and the Reclamation Contract, the Company assumed the obligations to reclaim and restore the land associated with the Marshall Mine. As of September 30, 2020, the Company recorded an asset retirement obligation for the total Reclamation Costs of \$21.3 million. The Company also recorded a receivable for the Reclamation Reimbursements at its estimated fair value of \$9.7 million. These transactions also resulted in the recording of property, plant, and equipment of \$3.9 million, spare parts of \$0.1 million, receivables of \$0.5 million, accounts payable and accrued liabilities of \$0.5 million, and upfront customer consideration of \$7.6 million. The upfront customer consideration is the excess of the fair value of the liabilities assumed over assets acquired and will be amortized on a straight-line basis as a reduction to revenue over the expected 15-year contractual period of the Supply Agreement.

We identified the accounting for these agreements and contracts as a critical audit matter due to the subjective judgment required to evaluate the appropriateness of the accounting guidance followed in recording these transactions, including the conclusions surrounding the interrelatedness of the transactions and the application of Generally Accepted Accounting Principles surrounding the treatment of the upfront customer consideration.

The primary procedures we performed to address this critical audit matter included:

- Evaluating management's significant accounting policies related to the various aspects of these transactions for appropriateness, which incorporated the use of a subject matter expert on technical accounting matters.

- Gaining an understanding of the transactions, including the business purpose and terms, by obtaining and reading the related contracts and through discussion with management.
- Evaluating the estimated future cash flows for consistency with the terms laid out in the contract.

Assessment of Impairment of Long-lived Assets

As described in Note 5 to the consolidated financial statements, as part of its periodic review of the carrying value of long-lived assets, the Company assesses its long-lived assets for potential impairment. At June 30, 2020, in assessing impairment of its advanced purification technologies (APT) segment and certain other long-lived asset groups (the Asset Group), based on market conditions such as current and future years' forecasted revenue and historically low prices of alternative power generation sources, management concluded there should be an impairment analysis of the Asset Group. Accordingly, the Company completed an undiscounted cash flow analysis of the Asset Group and estimated that the undiscounted cash flows from the Asset Group were less than the carrying value of the Asset Group. As such, the Company completed an assessment of the Asset Group's fair value, resulting in a \$26.1 million impairment and write-down of the Asset Group.

We identified the assessment and measurement of the impairment of the Asset Group as a critical audit matter due to the auditor judgment required to evaluate management's process for assessing and quantifying the impairment. Specifically, assessing certain internally developed assumptions included the need to involve our fair value specialists. These assumptions included cash flow forecasts and revenue growth rates, estimates relating to the cost structure and operating margins, and the discount rate.

The primary procedures we performed to address this critical audit matter included:

- Recalculating the mathematical accuracy of both the undiscounted cash flow analysis and the assessment of the Asset Group's fair value.
- Evaluating the Company's estimated cash flow forecasts and long-term revenue growth rates by comparing to historical data, current market conditions, and our knowledge of the Company's operations and the industry.
- Obtaining and evaluating the fair value report used to estimate the Asset Group's fair value which was prepared by management's third-party valuation specialist and was evaluated and approved by the Company's management team. This evaluation incorporated the use of the expertise of our internal fair value specialists. The work of our fair value specialists included reviews and analysis of the model and related assumptions used for the valuation of the Asset Group and the appropriateness of such modeling for the type of valuation being performed.

/s/ Moss Adams LLP

Denver, Colorado
March 10, 2021

We have served as the Company's auditor since 2017.

Advanced Emissions Solutions, Inc. and Subsidiaries
Consolidated Balance Sheets

<i>(in thousands, except share data)</i>	As of December 31,	
	2020	2019
ASSETS		
Current assets:		
Cash, cash equivalents and restricted cash	\$ 30,932	\$ 12,080
Receivables, net	13,125	7,430
Receivables, related party	3,453	4,246
Inventories, net	9,882	15,460
Prepaid expenses and other current assets	4,597	7,832
Total current assets	<u>61,989</u>	<u>47,048</u>
Restricted cash, long-term	5,000	5,000
Property, plant and equipment, net of accumulated depreciation of \$3,340 and \$7,444, respectively	29,433	44,001
Intangible assets, net	1,964	4,169
Equity method investments	7,692	39,155
Deferred tax assets, net	10,604	14,095
Other long-term assets, net	29,989	20,331
Total Assets	<u>\$ 146,671</u>	<u>\$ 173,799</u>
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 7,849	\$ 8,046
Accrued payroll and related liabilities	3,257	3,024
Current portion of long-term debt	18,441	23,932
Other current liabilities	12,996	4,311
Total current liabilities	<u>42,543</u>	<u>39,313</u>
Long-term debt, net of current portion	5,445	20,434
Other long-term liabilities	13,473	5,760
Total Liabilities	<u>61,461</u>	<u>65,507</u>
Commitments and contingencies (Notes 14)		
Stockholders' equity:		
Preferred stock: par value of \$.001 per share, 50,000,000 shares authorized, none outstanding	—	—
Common stock: par value of \$.001 per share, 100,000,000 shares authorized, 23,141,284 and 22,960,157 shares issued and 18,523,138 and 18,362,624 shares outstanding at December 31, 2020 and 2019, respectively	23	23
Treasury stock, at cost: 4,618,146 and 4,597,533 shares as of December 31, 2020 and 2019, respectively	(47,692)	(47,533)
Additional paid-in capital	100,425	98,466
Retained earnings	32,454	57,336
Total stockholders' equity	<u>85,210</u>	<u>108,292</u>
Total Liabilities and Stockholders' equity	<u>\$ 146,671</u>	<u>\$ 173,799</u>

See Notes to the Consolidated Financial Statements.

Advanced Emissions Solutions, Inc. and Subsidiaries
Consolidated Statements of Operations

<i>(in thousands, except per share data)</i>	Years Ended December 31,	
	2020	2019
Revenues:		
Consumables	\$ 48,122	\$ 53,187
License royalties, related party	13,440	16,899
Other	15	—
Total revenues	61,577	70,086
Operating expenses:		
Consumables cost of revenue, exclusive of depreciation and amortization	45,176	49,443
Other cost of revenue, exclusive of depreciation and amortization	(563)	—
Payroll and benefits	10,621	10,094
Legal and professional fees	5,585	9,948
General and administrative	8,228	8,123
Depreciation, amortization, depletion and accretion	8,537	7,371
Impairment of long-lived assets	26,103	—
Gain on settlement	(1,129)	—
Total operating expenses	102,558	84,979
Operating loss	(40,981)	(14,893)
Other income (expense):		
Earnings from equity method investments	30,978	69,176
Interest expense	(3,920)	(7,174)
Other	132	427
Total other income	27,190	62,429
(Loss) income before income tax expense	(13,791)	47,536
Income tax expense	6,511	11,999
Net (loss) income	\$ (20,302)	\$ 35,537
(Loss) earnings per common share (Note 1):		
Basic	\$ (1.12)	\$ 1.96
Diluted	\$ (1.12)	\$ 1.93
Weighted-average number of common shares outstanding:		
Basic	18,044	18,154
Diluted	18,044	18,372

See Notes to the Consolidated Financial Statements.

Advanced Emissions Solutions, Inc. and Subsidiaries
Consolidated Statements of Changes in Stockholders' Equity

<i>(in thousands, except share data)</i>	Common Stock		Treasury Stock		Additional Paid-in Capital	Retained Earnings/ (Accumulated Deficit)	Total Stockholders' Equity
	Shares	Amount	Shares	Amount			
Balances, January 1, 2019	22,640,677	\$ 23	(4,064,188)	\$ (41,740)	\$ 96,750	\$ 12,914	\$ 67,947
Cumulative effect of change in accounting principle (Note 7)	—	—	—	—	—	27,442	27,442
Stock-based compensation	298,573	—	—	—	2,011	—	2,011
Issuance of stock upon exercise of options, net	50,268	—	—	—	156	—	156
Repurchase of common shares to satisfy tax withholdings	(29,361)	—	—	—	(451)	—	(451)
Cash dividends declared on common stock	—	—	—	—	—	(18,557)	(18,557)
Repurchase of common shares	—	—	(533,345)	(5,793)	—	—	(5,793)
Net income	—	—	—	—	—	35,537	35,537
Balances, December 31, 2019	22,960,157	\$ 23	(4,597,533)	\$ (47,533)	\$ 98,466	\$ 57,336	\$ 108,292
Stock-based compensation	278,910	—	—	—	2,496	—	2,496
Repurchase of common shares to satisfy tax withholdings	(97,783)	—	—	—	(537)	—	(537)
Cash dividends declared on common stock	—	—	—	—	—	(4,580)	(4,580)
Repurchase of common shares	—	—	(20,613)	(159)	—	—	(159)
Net loss	—	—	—	—	—	(20,302)	(20,302)
Balances, December 31, 2020	23,141,284	\$ 23	(4,618,146)	\$ (47,692)	\$ 100,425	\$ 32,454	\$ 85,210

See Notes to the Consolidated Financial Statements.

Advanced Emissions Solutions, Inc. and Subsidiaries
Consolidated Statements of Cash Flows

<i>(in thousands)</i>	Years Ended December 31,	
	2020	2019
Cash flows from operating activities		
Net (loss) income	\$ (20,302)	\$ 35,537
Adjustments to reconcile net (loss) income to net cash used in operating activities:		
Deferred income tax expense	3,491	8,655
Depreciation, amortization, depletion and accretion	8,537	7,371
Amortization of debt discount and debt issuance costs	1,418	1,678
Operating lease expense	3,559	3,192
Impairment of long-lived assets	26,103	—
Gain on settlement	(1,129)	—
Recovery of accounts receivable and other receivables	(990)	—
Stock-based compensation expense	2,496	2,011
Earnings from equity method investments	(30,978)	(69,176)
Other non-cash items, net	192	638
Changes in operating assets and liabilities, net of effects of acquired businesses:		
Receivables, net	(2,541)	2,124
Related party receivables	794	37
Prepaid expenses and other current assets	3,234	(2,200)
Inventories, net	4,748	5,505
Other long-term assets, net	(1,005)	(262)
Accounts payable	(196)	2,218
Accrued payroll and related liabilities	233	(5,255)
Other current liabilities	(520)	(261)
Operating lease liabilities	(2,200)	(3,180)
Other long-term liabilities	(2,916)	(258)
Distributions from equity method investees, return on investment	62,441	73,888
Net cash provided by operating activities	54,469	62,262

<i>(in thousands)</i>	Years Ended December 31,	
	2020	2019
Cash flows from investing activities		
Acquisition of property, plant, equipment, and intangible assets, net	(6,685)	(7,851)
Mine development costs	(1,202)	(4,726)
Acquisition of business, net of cash acquired	—	(661)
Net cash used in investing activities	<u>(7,887)</u>	<u>(13,238)</u>
Cash flows from financing activities		
Principal payments on term loan	(24,000)	(30,000)
Borrowings from Paycheck Protection Program Loan	3,305	—
Dividends paid	(4,979)	(18,274)
Principal payments on finance lease obligations	(1,360)	(1,354)
Repurchase of shares to satisfy tax withholdings	(537)	(451)
Repurchase of common shares	(159)	(5,793)
Other	—	156
Net cash used in financing activities	<u>(27,730)</u>	<u>(55,716)</u>
Increase (decrease) in Cash, Cash Equivalents and Restricted Cash	18,852	(6,692)
Cash, Cash Equivalents and Restricted Cash, beginning of year	17,080	23,772
Cash, Cash Equivalents and Restricted Cash, end of year	<u>\$ 35,932</u>	<u>\$ 17,080</u>
Supplemental disclosure of cash flow information:		
Cash paid for interest	\$ 2,489	\$ 5,650
Cash (received) paid for income taxes	\$ (84)	\$ 4,308
Supplemental disclosure of non-cash investing and financing activities:		
Acquisition of property, plant and equipment under finance lease	\$ 158	\$ —
Dividends payable	\$ 32	\$ 284

See Notes to the Consolidated Financial Statements.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Note 1 - Summary of Operations and Significant Accounting Policies

Nature of Operations

Advanced Emissions Solutions, Inc. ("ADES" or the "Company") is a Delaware corporation with its principal office located in Greenwood Village, Colorado and operations located in Louisiana. The Company is principally engaged in the sale of consumable air and water treatment options including activated carbon ("AC") and chemical technologies. The Company's proprietary technologies in the advanced purification technologies ("APT") market enable customers to reduce air and water containments, including mercury and other pollutants, to maximize utilization levels and improve operating efficiencies to meet the challenges of existing and pending emission control regulations. Through its wholly-owned subsidiary, ADA Carbon Solutions, LLC ("Carbon Solutions"), which the Company acquired on December 7, 2018 (the "Carbon Solutions Acquisition"), the Company manufactures and sells AC used to capture and remove contaminants for coal-fired power plants, industrial and water treatment markets. Carbon Solutions also owns an associated lignite mine ("Five Forks Mine") that supplies the primary raw material for manufacturing AC.

Through its equity ownership in Tinium Group, LLC ("Tinium Group") and Tinium Services, LLC ("Tinium Services"), both of which are unconsolidated entities, the Company generates substantial earnings. Tinium Group provides reduction of mercury and nitrogen oxide ("NO_x") emissions at select coal-fired power generators through the production and sale of refined coal ("RC") that qualifies for tax credits under the Internal Revenue Code ("IRC") Section 45 - Production Tax Credit ("Section 45 tax credits"). The Company also earns royalties for technologies that are licensed to Tinium Group and used at certain RC facilities to enhance combustion and reduced emissions of NO_x and mercury from coal burned to generate electrical power. Tinium Services operates and maintains the RC facilities under operating and maintenance agreements with Tinium Group and owners or lessees of the RC facilities. Both Tinium Group and Tinium Services expect to significantly wind down their operations by the end of 2021 due to the expected expiration of the Section 45 tax credit period as of December 31, 2021.

Principles of Consolidation

The Consolidated Financial Statements include accounts of wholly-owned subsidiaries. All significant intercompany balances and transactions have been eliminated in consolidation.

All investments in partially owned entities for which the Company has greater than 20% ownership are accounted for using the equity method based on the legal form of the Company's ownership percentage and the applicable ownership percentage of the entity and are included in the Equity method investments line item in the Consolidated Balance Sheets. As of December 31, 2020, the Company holds equity interests of 42.5% and 50.0% in Tinium Group and Tinium Services, LLC ("Tinium Services"), respectively. Tinium Group is deemed to be variable interest entity ("VIE") under the VIE model of consolidation, but the Company does not consolidate Tinium Group as it is not deemed to be its primary beneficiary.

Cash, cash equivalents and restricted cash

Cash and cash equivalents include bank deposits and other highly liquid investments purchased with an original maturity of three months or less.

Restricted cash primarily consists of minimum cash balance requirements under the Term Loan and Security Agreement (the "Senior Term Loan") and a surety bond indemnification agreement (the "Surety Agreement") associated with reclamation of a mine. Restricted cash is classified consistent with the underlying obligation.

Receivables, net

Receivables, net are recorded at net realizable value. This carrying value includes an appropriate allowance for estimated uncollectible amounts to reflect any loss anticipated on the receivables balances. Increases and decreases in the allowance for doubtful accounts are established based upon changes in the credit quality of receivables and are included as a component of the General and administrative line item in the Consolidated Statements of Operations. The allowance for doubtful accounts is based on historical experience, general economic conditions and the credit quality of specific accounts.

Inventories, net

Inventories, net are stated at the lower of average cost or net realizable value and consist principally of raw materials and finished goods related to the Company's AC and chemical product offerings. The cost of inventory is determined using the average cost method.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Inventories are periodically reviewed for both potential obsolescence and potential declines in anticipated selling prices. In this review, the Company makes assumptions about the future demand for and market value of the inventory, and estimates the amount of any obsolete, unmarketable, slow moving or overvalued inventory. The Company will write down the value of inventories by an amount equal to the difference between the cost of the inventory and its estimated net realizable value.

Additional details regarding Inventory balances are included in Note 9.

Intangible Assets

Intangible assets consist of patents, licensed technology, customer relationships, developed technologies and trade names.

The Company has developed technologies resulting in patents being granted by the U.S. Patent and Trademark Office or other regulatory offices. Legal costs associated with securing the patent are capitalized and amortized over the legal or useful life beginning on the patent filing date. The remaining intangible assets were recorded at fair value in connection with the Carbon Solutions Acquisition.

The following table details the components of the Company's intangible assets:

<i>(in thousands, except years)</i>	Weighted average amortization (in years)	As of December 31,			
		2020		2019	
		Initial Cost (1)	Net of Accumulated Amortization	Initial Cost	Net of Accumulated Amortization
Customer relationships	5	\$ 835	\$ 713	\$ 2,200	\$ 1,731
Patents	9	1,306	733	1,489	1,039
Developed technology	5	607	518	1,600	1,259
Trade name	2	36	—	300	140
Total		\$ 2,784	\$ 1,964	\$ 5,589	\$ 4,169

(1) As of December 31, 2020, initial costs were inclusive of the write down of intangibles to fair value based on the impairment charge taken during the year ended December 31, 2020 and further described in Note 5.

Included in the Consolidated Statements of Operations is amortization expense related to intangible assets of \$1.0 million and \$1.0 million for the years ended December 31, 2020 and 2019, respectively. The estimated future amortization expense for existing intangible assets as of December 31, 2020 is expected to be \$0.3 million for each of the five succeeding fiscal years.

Investments

The investments in entities in which the Company does not have a controlling interest (financial or operating), but where it has the ability to exercise significant influence over operating and financial policies, are accounted for using the equity method of accounting. Whether or not the Company exercises significant influence with respect to an investee depends on an evaluation of several factors including, among others, representation on the investee company's board of directors and the Company's ownership level. Under the equity method of accounting, an investee company's accounts are not reflected in the Company's Consolidated Balance Sheets and Consolidated Statements of Operations; however, the Company's share of the earnings or losses of the investee company is reported in the Earnings from equity method investments line item in the Consolidated Statements of Operations, and the Company's carrying value in an equity method investee company is reported in the Equity method investments line in the Consolidated Balance Sheets.

When the Company receives distributions in excess of the carrying value of the investment and has not guaranteed any obligations of the investee and/or is not required to provide additional funding to the investee, the Company recognizes such excess distributions as equity method earnings in the period the distributions occur. When the investee subsequently reports income, the Company does not record its share of such income until it equals the amount of distributions in excess of carrying value that were previously recognized in income. During the years ended December 31, 2020 and 2019, the Company had no guarantees or requirements to provide additional funding to investees.

Additionally, when the Company's carrying value in an equity method investment is zero, and the Company has not guaranteed any obligations of the investee and/or is not required to provide additional funding to the investee, the Company will not recognize its share of any reported losses by the investee until future earnings are generated to offset previously unrecognized

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

losses. As a result, equity income or loss reported in the Company's Consolidated Statements of Operations for certain equity method investees may differ from a mathematical calculation of net income or loss attributable to its equity interest based on the percentage ownership of the Company's equity interest and the net income or loss attributable to equity owners as shown in the investee company's statements of operations. Likewise, distributions from equity method investees are reported in the Consolidated Statements of Cash Flows as "return on investment" in Operating cash flows until such time as the carrying value in an equity method investee company is reduced to zero; thereafter, such distributions are reported as "distributions in excess of cumulative earnings" in Investing cash flows. See Note 7 for additional information regarding the Company's equity method investments.

Investments in partially-owned subsidiaries for which the Company has less-than-20% ownership are accounted for in accordance with accounting guidance applicable to equity investments that do not qualify for the equity method of accounting. The Company evaluates these types of investments for changes in fair value and, if there is change, recognizes the change in the Consolidated Statement of Operations. If no such events or changes in circumstances have occurred related to these types of investments, the fair value is estimated only if practicable to do so.

Property, Plant and Equipment

Property, plant and equipment is stated at cost less accumulated depreciation and includes leasehold improvements. Depreciation on assets is computed using the straight-line method over the lesser of the estimated useful lives of the related assets or the lease term (ranging from 1 to 31 years). Maintenance and repairs that do not extend the useful life of the respective asset are charged to Operating expenses as incurred. When assets are retired, or otherwise disposed of, the property accounts are relieved of costs and accumulated depreciation and any resulting gain or loss is credited or charged to income. The Company performs an evaluation of the recoverability of the carrying value of its property, plant and equipment to determine if facts and circumstances indicate that their carrying value may be impaired. Impairment charges are recorded to Operating expenses in the Consolidated Statements of Operations. Amortization of finance leased assets is included in depreciation expense and is calculated using the straight-line method over the term of the lease.

Leases

The Company records a right of use ("ROU") asset and related liability under a contract or part of a contract when it conveys the right to control the use of an identified asset for a period of time in exchange for consideration. Control over the use of an identified asset means that an entity has both the right to obtain substantially all of the economic benefits from the use of an identified asset and the right to direct the use of that identified asset. The determination of whether a contract contains a lease may require significant assumptions and judgments.

For all classes of underlying assets, the Company does not separate nonlease components from lease components and accounts for each separate lease component and the nonlease components associated with that lease component as a single lease component. The Company records lease liabilities and related ROU assets for all leases that have a term of greater than one year. For short-term leases (leases with terms of less than one year), the Company expenses lease payments on a straight-line basis over the lease term.

Variable lease payments represent payments made by a lessee for the right to use an underlying asset that vary because of changes in facts or circumstances occurring after the commencement date of a lease other than the passage of time. Variable lease payments that are based on an index or rate, calculated by using the index or rate that exists on the lease commencement date, are included in the measurement of a lease liability. Certain of the Company's operating leases for office facilities contain variable lease components that are not based on an index or rate, and the Company recognizes these payments as lease expense in the period in which the obligation for those payments is incurred.

The Company calculates lease liabilities based on the present value of lease payments discounted by the rate implicit in the lease or, if not readily determinable, the Company's incremental borrowing rate.

Finance lease liabilities are subsequently measured by increasing the carrying amount to reflect interest expense on the finance lease liability and reducing the carrying amount of the lease liability to reflect lease payments made during the period. Interest on finance lease liabilities is determined in each period during the lease term as the amount that produces a constant periodic discount rate on the remaining balance of the lease liability. ROU assets under finance leases are amortized over the remaining lease term on a straight-line basis. Interest expense related to finance lease liabilities and amortization of ROU assets under finance leases are included in Interest expense and Depreciation, amortization, depletion and accretion, respectively, in the Consolidated Statement of Operations.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Operating lease liabilities are subsequently measured at the present value of the lease payments not yet paid discounted using the discount rate for the lease established at the inception date of the lease. ROU assets under operating leases are subsequently measured at the amounts of the related operating lease liability, adjusted for, as applicable, prepaid or accrued lease payments, the remaining balance of any lease incentives received, unamortized initial direct costs and impairment. Lease expense from operating leases is recognized as a single lease cost over the remaining lease term on a straight-line basis. Variable lease payments not included in operating lease liabilities are recognized as expense in the period in which the obligation for those payments is incurred. Lease expense from operating leases is included in the "General and administrative" line in the Consolidated Statement of Operations.

Other Assets

Mine Development Costs

Mine development costs are related to the Five Forks Mine and are stated at cost less accumulated depletion and include acquisition costs, the cost of other development work and mitigation costs. Costs are amortized over the estimated life of the related mine reserves, which is 16 years. The Company performs an evaluation of the recoverability of the carrying value of mine development costs to determine if facts and circumstances indicate that their carrying value may be impaired and if any adjustment is warranted. Mine development costs are reported in the "Other long-term assets, net" line item in the Consolidated Balance Sheet.

Spare Parts

Spare parts include critical spares required to support plant operations. Parts and supply costs are determined using the lower of cost or estimated replacement cost. Parts are recorded as maintenance expenses in the period in which they are consumed. Spare parts are reported in the "Other long-term assets, net" line item in the Consolidated Balance Sheet.

Revenue Recognition

The Company recognizes revenue from a contract with a customer when a performance obligation under the terms of a contract with a customer is satisfied, which is when the customer controls the promised goods or services that are transferred in satisfaction of the performance obligation. Revenue is measured as the amount of consideration that is expected to be received in exchange for transferring goods or providing services, and the transaction price is generally fixed and generally does not contain variable or noncash consideration. In addition, the Company's contracts with customers generally do not contain customer refund or return provisions or other similar obligations. Transfer of control and satisfaction of performance obligations are further discussed in each of the revenue components listed below.

The Company uses estimates and judgments in determining the nature and timing of satisfaction of performance obligations, the standalone selling price ("SSP") of performance obligations and the allocation of the transaction price to multiple performance obligations, if any.

The Company's revenue components are Consumables sales and License royalties.

Consumables

The Company is principally engaged in the sale of consumable products that utilize activated carbon ("AC") and chemical based technologies to a broad range of customers, including coal-fired utilities, water treatment plants, and other diverse markets. Our proprietary technologies and associated product offerings provide purification solutions to enable our customers to reduce certain contaminants and pollutants and thus maximize utilization levels and improve operating efficiencies to meet the challenges of existing and potential regulations.

Generally, customer contracts for consumables are short duration and performance obligations generally do not extend beyond one year.

License royalties, related party

The Company generates revenues from royalties ("M-45 Royalties") earned under a licensing arrangement ("M-45 License") of its M-45TM and M-45-PCTM emissions control technologies ("M-45 Technology") between the Company and Tinum Group. The Company recognizes M-45 Royalties at a point in time based on the use of the M-45 Technology at certain RC facilities or through Tinum Group's use of licensed technology for rates in excess of amounts allowed for RC application. The amount of M-45 Royalties recognized is generally based on a percentage of pre-tax margins (as defined in the M-45 License) of the RC facilities using the M-45 Technology.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Practical Expedients and Exemptions

The Company does not disclose the value of unsatisfied performance obligations for contracts with an original expected length of one year or less.

Sales and other taxes that are collected concurrently with revenue-producing activities are excluded from revenue.

The Company accounts for freight costs as activities to fulfill the promise to transfer the goods, and therefore these activities are also not assessed as a separate service to customers.

The Company accounts for all shipping and handling activities that occur after control of the related good transfers as fulfillment activities. These activities are included in Cost of Revenue line items on the Consolidated Statement of Operations.

The Company generally expenses sales commissions when incurred because the amortization period of the asset that the Company would have recognized is one year or less. These costs are recorded in sales and marketing expenses in the Depreciation, amortization, depletion and accretion line item on the Consolidated Statement of Operations.

Cost of Revenue

Cost of revenue includes all labor, fringe benefits, subcontract labor, additive and coal costs, materials, equipment, supplies, travel costs and any other costs and expenses directly related to the Company's production of revenues. The Company records estimated contract losses, if any, in the period they are determined.

Payroll and Benefits

Payroll and benefits costs include direct payroll, personnel related fringe benefits, sales and administrative staff labor costs and stock compensation expense. Payroll and benefits costs exclude direct labor included in Cost of revenue.

Legal and Professional

Legal and professional costs include external legal, audit and consulting expenses.

General and Administrative

General and administrative costs include director fees and expenses, rent, insurance and occupancy-related expenses, bad debt expense, impairments and other general costs of conducting business.

Research and development costs are charged to expense in the period incurred and are reported in the General and administrative line item in the Consolidated Statements of Operations. During the years ended December 31, 2020 and 2019, the Company recorded research and development costs of \$1.0 million and \$0.2 million, respectively.

Asset Retirement Obligations

Asset retirement obligations ("ARO") are comprised of mine reclamation activities required under operating agreements related to the Five Forks Mine and the Marshall Mine (as defined in Note 3) and are recognized when incurred and recorded as liabilities at fair value. An ARO is accreted over time through periodic charges to earnings. Accounting for reclamation and remediation obligations requires the Company to make estimates of future costs unique to a specific mining operation that the Company expects to incur to complete the reclamation and remediation work required to comply with existing laws and regulations. AROs are periodically adjusted to reflect changes in the estimated present value resulting from the passage of time and revisions to the estimates of either the timing or amount of the reclamation costs.

Five Forks Mine

For the Five Forks Mine ARO, a corresponding ARO asset is depreciated over its estimated life. Reclamation costs related to the Five Forks Mine are allocated to expense over the life of the related mine assets, and are periodically adjusted to reflect changes in the estimated present value resulting from the passage of time and revisions to the estimates of either the timing or amount of the reclamation costs. Remediation costs for the Five Forks Mine are accrued based on management's best estimate at the end of each period of the costs expected to be incurred. Such cost estimates may include ongoing care, maintenance and monitoring costs. Reclamation obligations are based on the timing of estimated spending for an existing environmental disturbance. On an annual basis, unless otherwise deemed necessary, the Company reviews its estimates and assumptions of the Five Forks Mine ARO.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

The Company's mining activities at the Five Forks Mine are subject to various domestic laws and regulations governing the protection of the environment. The Company conducts its mining activities to protect public health and the environment and believes its operations are in compliance with applicable laws and regulations in all material respects. The Company has made, and expects to make in the future, expenditures to comply with such laws and regulations, but cannot predict the full amount of such future expenditures. Estimated future reclamation costs are based principally on current legal and regulatory requirements.

Marshall Mine (refer to Note 3)

Reclamation costs related to the Marshall Mine are largely based on a capped fee structure, based on the initial estimate of the total costs of reclamation, which provides for certain contingencies that could increase or decrease the reclamation fee based on the reclamation agreement executed between the Company and the Marshall Mine operator. The timing of payments may vary and the Company accounts for these timing differences in valuing the reclamation as well as changes in actual reclamation costs on a quarterly basis.

Income Taxes

The Company accounts for income taxes under the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements. Under this method, deferred tax assets and liabilities are determined on the basis of differences between the financial statements and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in operations in the period that includes the enactment date.

The Company recognizes deferred tax assets and liabilities and maintains valuation allowances where it is more likely than not that all or a portion of deferred tax assets will not be realized. In making such a determination, the Company considers all available positive and negative evidence, including future reversals of existing taxable temporary differences, projected future taxable income, tax-planning strategies, and results of recent operations.

The Company records uncertain tax positions on the basis of a two-step process whereby (1) the Company determines whether it is more-likely-than-not that the tax positions will be sustained on the basis of the technical merits of the position and (2) for those tax positions that meet the more-likely-than-not recognition threshold, the Company recognizes the amount of tax benefit that is more than 50 percent likely to be realized upon ultimate settlement with the related tax authority.

The Company records interest expense due to the Company's share of Tinuum Group's equity method earnings for Refined Coal ("RC") facilities, in which the sale of an RC facility or lease income generated from an RC facility are treated as installment sales for federal income tax purposes. IRS section 453A requires taxpayers using the installment method to pay an interest charge on the portion of the tax liability that is deferred under the installment method. The Company recognizes IRS section 453A interest ("453A interest") and other interest and penalties related to unrecognized tax benefits in the Interest expense line item in the Consolidated Statements of Operations.

Stock-Based Compensation

Stock-based compensation expense is measured at the grant date based on the estimated fair value of the stock-based award and is generally expensed on a straight-line basis over the requisite service period and/or performance period of the award. Forfeitures are recognized when incurred. Stock-based compensation expense related to manufacturing employees and administrative employees is included in the Consumables, Cost of revenues and Payroll and benefits line items, respectively, on the Consolidated Statement of Operations. Stock-based compensation expense related to non-employee directors and consultants is included in the General and administrative line item in the Consolidated Statement of Operations.

Dividends

When a sufficient amount of available earnings exists at the time of a dividend declaration, dividends are charged to Retained earnings when declared. If a sufficient amount of available earnings is not available, dividends declared are charged as a reduction to Additional paid-in capital.

Earnings (Loss) Per Share

Basic earnings (loss) per share is computed using the two-class method, which is an earnings allocation formula that determines earnings (loss) per share for common stock and any participating securities according to dividend and participating rights in undistributed earnings. The Company's restricted stock awards ("RSA's") granted prior to December 31, 2016 contain non-

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

forfeitable rights to dividends or dividend equivalents and are deemed to be participating securities ("Participating Securities"). RSA's granted subsequent to December 31, 2016 do not contain non-forfeitable rights to dividends and are not deemed to be Participating Securities. As permitted, the Company has elected not to separately present basic or diluted earnings per share attributable to Participating Securities in the Consolidated Statement of Operations.

Diluted earnings per share is computed in a manner consistent with that of basic earnings per share, while considering other potentially dilutive securities. Potentially dilutive securities consist of both unvested, Participating Securities and non-participating RSA's, as well as outstanding options to purchase common stock ("Stock Options") and contingent performance stock units ("PSU's") (collectively, "Potential dilutive shares"). The dilutive effect, if any, for non-participating RSA's, Stock Options and PSU's is determined using the greater of dilution as calculated under the treasury stock method or the two-class method. Potential dilutive shares are excluded from diluted earnings (loss) per share when their effect is anti-dilutive. When there is a net loss for a period, all Potential dilutive shares are anti-dilutive and are excluded from the calculation of diluted loss per share for that period.

Each PSU represents a contingent right to receive shares of the Company's common stock, and the number of shares may range from zero to two times the number of PSU's granted on the award date depending upon the price performance of the Company's common stock as measured against a general index and a specific peer group index over requisite performance periods. The number of Potential dilutive shares related to PSU's is based on the number of shares of the Company's common stock, if any, that would be issuable at the end of the respective reporting period, assuming that the end of the reporting period is the end of the contingency period applicable to such PSU's. See Note 16 for additional information related to PSU's.

The following table sets forth the calculations of basic and diluted earnings per common share:

<i>(in thousands, except per share amounts)</i>	Years Ended December 31,	
	2020	2019
Net (loss) income	\$ (20,302)	\$ 35,537
Less: Dividends and undistributed income allocated to Participating Securities	(5)	44
(Loss) income attributable to common stockholders	\$ (20,297)	\$ 35,493
Basic weighted-average number of common shares outstanding	18,044	18,154
Add: dilutive effect of equity instruments	—	218
Diluted weighted-average shares outstanding	18,044	18,372
Earnings (loss) per share - basic	\$ (1.12)	\$ 1.96
Earnings (loss) per share - diluted	\$ (1.12)	\$ 1.93

For the years ended December 31, 2020 and 2019, 0.6 million and 0.3 million weighted-average equity instruments, respectively, were outstanding but were not included in the computation of diluted earnings per share because their effect would have been anti-dilutive.

Use of Estimates

The preparation of the Company's consolidated financial statements in conformity with accounting principles generally accepted in the United States ("U.S. GAAP") requires the Company's management to make estimates and assumptions that affect the amounts reported in these financial statements and accompanying notes. Actual results could differ from those estimates. The Company makes assumptions on the following significant financial statement components including:

- business combinations, including asset acquisitions;
- the carrying value of its long-lived assets;
- the carrying value of its intangible assets;
- AROs; and
- income taxes, including the valuation allowance for deferred tax assets and uncertain tax positions.

Due to the coronavirus ("COVID-19") pandemic, there has been uncertainty and disruption in the global economy and financial markets. Additionally, due to COVID-19, overall power generation and coal-fired power demand may change, which could also

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

have a material adverse effect on the Company. The Company is not aware of any specific event or circumstance due to COVID-19 that would require an update to its estimates or judgments or a revision of the carrying values of its assets or liabilities through the date of this Report. These estimates may change as new events occur and additional information is obtained. Actual results could differ materially from these estimates under different assumptions or conditions

Risks and Uncertainties

The Company's earnings are significantly affected by equity earnings it receives from Tinum Group. As of December 31, 2020, Tinum Group has 23 invested RC facilities of which 9 are leased to a single customer. Both Tinum Group and Tinum Services expect to significantly wind down their operations by the end of 2021 due to the expected expiration of the Section 45 tax credit period as of December 31, 2021. The loss of Tinum Group's customers, reduction in revenue streams as a result of lease renewals and the expiration of Section 45 tax credits will have a significant adverse impact on Tinum Group's financial position, results of operations and cash flows, which in turn will have a material adverse impact on the Company's financial position, results of operations and cash flows.

Reclassifications

Certain balances have been reclassified from prior years to conform to the current year presentation. Such reclassifications had no effect on the Company's results of operations or financial position in any of the periods presented.

New Accounting Guidance

Not yet Adopted

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments - Credit Losses (Topic 326) Measurement of Credit Losses on Financial Instruments* ("ASU 2016-13"). The main objective of ASU 2016-13 is to provide financial statement users with more decision-useful information about the expected credit losses on financial instruments and other commitments to extend credit held by a reporting entity at each reporting date. To achieve this objective, the amendments in ASU 2016-13 replace the incurred loss impairment methodology in current U.S. GAAP with a methodology that reflects expected credit losses and requires consideration of a broader range of reasonable and supportable information to inform credit loss estimates. ASU 2016-13 is effective for "smaller reporting companies" (as defined by the Securities and Exchange Commission) for fiscal years beginning after December 15, 2022, including interim periods within those years, and must be adopted under a modified retrospective method approach. Entities may adopt ASU 2016-13 earlier as of the fiscal years beginning after December 15, 2018, including interim periods within those years. The Company is currently evaluating the provisions of this guidance and assessing its impact on the Company's financial statements and disclosures and does not believe this standard will have a material impact on the Company's financial statements and disclosures.

In December 2019, the FASB issued ASU 2019-12, *Income Taxes (Topic 740) Simplifying the Accounting for Income Taxes* ("ASU 2019-12"). The amendments in ASU 2019-12 simplify various aspects related to accounting for income taxes by removing certain exceptions contained in Topic 740 and also clarifies and amends existing guidance in Topic 740 to improve consistent application. ASU 2019-12 is effective for public business entities beginning after December 15, 2020, including interim periods within those years, and early adoption is permitted. The Company is currently evaluating the provisions of this guidance and assessing its impact on the Company's financial statements and disclosures and does not believe this standard will have a material impact on the Company's financial statements and disclosures.

Note 2 - Customer Supply Agreement

On September 30, 2020, the Company and Cabot Norit Americas, Inc., ("Cabot") entered into a supply agreement (the "Supply Agreement") pursuant to which the Company agrees to sell and deliver to Cabot, and Cabot agrees to purchase and accept from the Company certain lignite-based AC products ("Furnace Products"). The term of the Supply Agreement is for 15 years with 10-year renewal terms that are automatic unless either party provides three years prior notice of intention not to renew before the end of any term.

In addition to the sale by the Company and purchase by Cabot of Furnace Products, the Company and Cabot have agreed to additional terms whereby Cabot will reimburse the Company for certain capital expenditures incurred by the Company that are necessary to manufacture the Furnace Products. Reimbursements will be in the form of revenues earned from capital expenditures incurred that will benefit both the Company and Cabot (referred to as "Shared Capital") and capital expenditures incurred that will benefit Cabot exclusively (referred to as "Specific Capital").

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Revenues are earned on Shared Capital ("Shared Capital revenues") based on the percentage of planned Furnace Products produced and sold divided by the Company's total products produced and sold for each year multiplied by a factor, which is based on the cost of Shared Capital assets placed in service amortized as an annuity over the expected asset life (lives) using an interest rate that is mutually agreed to by both the Company and Cabot. Shared Capital revenues are recognized and billable beginning on the first day of a half year (either January 1 or July 1 of a calendar year) following the placed in service date of a Shared Capital asset(s).

Revenues are earned on Specific Capital ("Specific Capital revenues") and are based on a factor, which is based on the cost of Specific Capital assets placed in service amortized as an annuity over five years using an interest rate that is mutually agreed to by both the Company and Cabot. Specific Capital revenues are recognized beginning on the first day of a half year (either January 1 or July 1 of a calendar year) following the placed in service date of a Specific Capital asset(s) and are billable in quarterly installments beginning on the first day of a half year following the placed in service date of a Specific Capital asset(s). In the event that Cabot ceases to make purchases under the Supply Agreement, Cabot is obligated to pay the balance of any outstanding payments for Specific Capital.

Note 3 - Acquisition of Marshall Mine

Concurrently with the execution of the Supply Agreement, on September 30, 2020, the Company entered into an agreement to purchase (the "Mine Purchase Agreement") from Cabot 100% of the membership interests in Marshall Mine, LLC (the "Marshall Mine Acquisition") for a nominal purchase price. Marshall Mine, LLC owns a lignite mine located outside of Marshall, Texas (the "Marshall Mine"). The Company independently determined to immediately commence activities to shutter the Marshall Mine and will incur the associated reclamation costs.

In conjunction with the execution of the Supply Agreement and the Mine Purchase Agreement, on September 30, 2020, the Company entered into a reclamation contract (the "Reclamation Contract") with a third party that provides a capped cost, subject to certain contingencies, in the amount of approximately \$19.7 million plus an obligation to pay certain direct costs of approximately \$3.6 million (collectively, the "Reclamation Costs") over the estimated reclamation period of 10 years (the "Reclamation Period"). Under the terms of the Supply Agreement, Cabot is obligated to reimburse the Company for \$10.2 million of Reclamation Costs (the "Reclamation Reimbursements"), which are payable semi-annually over 13 years and inclusive of interest. In the event that Cabot has a change in control as described in the Supply Agreement, all outstanding balances of the Reclamation Reimbursements shall be due and payable in full. See further discussion of the Reclamation Costs and Reclamation Reimbursements in Note 4.

As the owner of the Marshall Mine, the Company was required to post a surety bond to ensure performance of its reclamation activities. On September 30, 2020, the Company and a third party entered into a Surety Bond Indemnification Agreement (the "Surety Agreement") pursuant to which the Company secured and posted a \$30.0 million surety bond (the "Bond") with the local regulatory agency. The Bond will remain in place until the Marshall Mine is fully shuttered, and it may be reduced in amount from time to time as the Company progresses with its reclamation activities. For the obligations due under the Reclamation Contract, the Company was required to post collateral of \$5.0 million as of September 30, 2020 and to post an additional \$5.0 million as of March 31, 2021.

The Marshall Mine Acquisition included the acquisition of certain assets that will be consumed and the assumption of certain liabilities that will be paid in reclamation of the Marshall Mine, in addition to the incurrence of an obligation for the Reclamation Costs. The Company determined that the Marshall Mine Acquisition should be accounted for as an asset acquisition as it did not meet the definition of a business. The Company's conclusion was based on the Marshall Mine not having any economic reserves, as the Company commenced full reclamation as of September 30, 2020, and therefore lacked inputs.

As the Marshall Mine Acquisition represents a transaction with a customer of net assets acquired and liabilities assumed from Cabot, the Company has accounted for the excess of the fair value of liabilities assumed over assets acquired as upfront consideration transferred to a customer, Cabot (the "Upfront Customer Consideration"). The amount of the Upfront Customer Consideration was recognized net of an additional asset recognized in the Marshall Mine Acquisition, which was comprised of a receivable from Cabot (the "Cabot Receivable") for the Reclamation Reimbursements. The Cabot Receivable is further discussed in Note 4.

The total Upfront Customer Consideration is amortized on a straight-line basis as a reduction to revenue over the expected 15-year contractual period of the Supply Agreement.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

The Company paid a nominal cash amount to Cabot in the form of cash for the Marshall Mine and also assumed liabilities whose fair value exceeded the fair value of assets acquired. The net assets acquired and liabilities assumed and the additional assets recorded for the Marshall Mine Acquisition as of September 30, 2020 are shown in the table below. Subsequent to this date, the Company completed additional analysis and adjustments were made as noted in the table below:

<i>(in thousands)</i>	As Originally Reported	Adjustments	As Adjusted
Assets acquired:			
Receivables	\$ —	\$ 513	\$ 513
Property, plant and equipment	3,863	—	3,863
Spare parts	100	—	100
Liabilities assumed:			
Accounts payable and accrued expenses	(673)	160	(513)
Asset retirement obligation	(21,328)	—	(21,328)
Net assets acquired and liabilities assumed from Marshall Mine acquisition	(18,038)	673	(17,365)
Cabot receivable	9,749	—	9,749
Upfront Customer Consideration	<u>\$ 8,289</u>	<u>\$ (673)</u>	<u>\$ 7,616</u>

The Company also evaluated the Marshall Mine entity as a VIE, and determined that because of its structure and closing-stage status, it does not have sufficient equity at-risk and would not likely be able to obtain additional subordinated financial support to complete its closing stage obligations. The Company purchased all of the membership interests in Marshall Mine, LLC and has determined that it meets the definition of a VIE and that the Company is the primary beneficiary. Therefore, Marshall Mine, LLC's assets and liabilities are consolidated as of December 31, 2020.

Note 4 - Marshall Mine Asset Retirement Obligation and related Cabot Receivable

Asset Retirement Obligation

In connection with the Supply Agreement, Mine Purchase Agreement and the Reclamation Contract, the Company assumed the obligation to reclaim and restore the land associated with the Marshall Mine. The Company determined that the Marshall Mine does not have any remaining economic reserves. As of September 30, 2020, the Company recorded an ARO (the "Marshall Mine ARO") for the total Reclamation Costs of \$21.3 million as measured at the expected future cash flows of \$23.7 million, inclusive of contingency costs, discounted to their present value using a discount rate based on a credit-adjusted, risk-free rate of 7.0%.

Cabot Receivable

As previously disclosed, under the terms of the related Supply Agreement, Cabot is obligated to pay Reclamation Reimbursements to the Company for \$10.2 million of the Reclamation Costs, inclusive of interest. As of September 30, 2020, the Company recorded the Cabot Receivable for the Reclamation Reimbursements at its estimated fair value, which was measured using a discounted cash flows valuation model that considers the estimated credit risk associated with the obligor's (Cabot's) future performance. Interest is accreted on a monthly basis and recognized as interest income. There were no significant related fees or costs associated with the Cabot Receivable.

As of September 30, 2020, the Company recorded the Cabot Receivable at its estimated fair value of \$9.7 million, reflecting a discount rate of approximately 1.5% or \$0.5 million. Allowances for this asset are assessed periodically, and no allowance was deemed necessary as of December 31, 2020.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Note 5 - Impairment

As part of its periodic review of the carrying value of long-lived assets, the Company assessed its long-lived assets for potential impairment. In assessing impairment of its APT segment's long-lived asset groups, the Company considered factors such as the significant decline in both the APT segment's trailing twelve months revenues and current and future years' forecasted revenues. These factors were largely due to the significant drop in coal-fired power dispatch amid historically low prices of alternative power generation sources, such as natural gas, leading to an increase in natural gas usage as well as other competing energy sources.

As of June 30, 2020, the Company completed an undiscounted cash flow analysis of its APT segment's long-lived assets (the "Asset Group"), which were comprised of its manufacturing plant and related assets and its lignite mine assets. The estimated undiscounted cash flows from the Asset Group was \$54.7 million, which was less than the carrying value of the Asset Group of \$58.3 million. Accordingly, the Company completed an assessment of the Asset Group's fair value and estimated the fair value of the Asset Group at \$32.2 million. This resulted in an impairment and write-down of the Asset Group (the "Impairment Charge") of \$26.1 million as of June 30, 2020. The Impairment Charge is reflected as "Impairment of long-lived assets" in the Consolidated Statement of Operations for the year ended December 31, 2020, and was allocated to the APT segment.

The following table summarizes the allocation to the Asset Group of the Impairment Charge of \$26.1 million recorded as of June 30, 2020:

(in thousands)

Property, plant and equipment, net	\$	18,986
Intangible assets, net		1,445
Other long-term assets, net		5,672
Total impairment	\$	<u>26,103</u>

The Company engaged an independent third party to perform the valuation of the Asset Group in order to determine the estimated fair value of the Asset Group. This valuation was based on the use of several established valuation models including an expected future discounted cash flow model using Level 3 inputs. The cash flows are those expected to be generated by market participants discounted at the risk-free rate of interest. Because of the continued future uncertainty surrounding the level of coal-fired dispatch, the impact of historically low natural gas prices and other estimates impacting the expected future cash flow, it is reasonably possible that the expected future cash flows may change in the near term and may result in the Company recording additional impairment of the Asset Group.

Note 6 - COVID-19

In response to the COVID-19 outbreak, in March 2020, the federal government passed the Coronavirus Aid, Relief, and Economic Security Act (the "CARES Act"). The CARES Act provided, among other things, the creation of the Paycheck Protection Program ("PPP"), which is sponsored and administered by the U.S. Small Business Administration ("SBA"). In June 2020, the Paycheck Protection Program Flexibility Act of 2020 (the "PPPFA") was signed into law and established the payment dates in the event that amounts borrowed under the PPP are not forgiven.

On April 20, 2020, the Company entered into a loan (the "PPP Loan") under the PPP, evidenced by a promissory note, with BOK, NA dba Bank of Oklahoma ("BOK") providing for \$3.3 million in proceeds, which was funded to the Company on April 21, 2020. The PPP Loan matures April 21, 2022. The PPP Loan principal may be forgiven subject to the terms of the PPP and approval by the SBA. The Company recorded the PPP Loan as a debt obligation and is accruing interest over the term of the PPP Loan. There is no assurance that the PPP Loan will be forgiven.

The interest rate on the PPP Loan is 1.0%. The PPP Loan is unsecured and contains customary events of default relating to, among other things, payment defaults, making materially false and misleading representations to the SBA or BOK, or breaching the terms of the PPP Loan. The occurrence of an event of default may result in the repayment of all amounts outstanding, collection of all amounts owing from the Company, or filing suit and obtaining judgment against the Company.

Under the PPPFA, monthly payments of principal and interest commence on the later of 10 months following the "covered period" (as defined in the PPPFA) or the date that BOK notifies the Company that the SBA has notified BOK that all or a portion of the PPP Loan has not been forgiven. In January 2021, the Company submitted its application to the SBA for

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

forgiveness of the PPP Loan, and the Company is awaiting the SBA's response on its application for forgiveness. Accordingly, the Company has determined that any amounts due under the PPP Loan would commence in August 2021 and, as of December 31, 2020, has classified a portion of the PPP Loan principal and accrued interest as current in the Consolidated Balance Sheet.

The CARES Act also provided the deferral of payroll tax payments for all payroll taxes incurred through December 31, 2020. The Company elected to defer payments of payroll taxes for the periods allowed under the CARES Act and will repay 50% by December 31, 2021 and 50% by December 31, 2022. As of December 31, 2020, the Company has deferred \$0.4 million of payroll tax payments under the CARES Act.

Note 7 - Equity Method Investments

Tinum Group, LLC

As of December 31, 2020 and 2019, the Company's ownership in Tinum Group was 42.5%. Tinum Group supplies technology, equipment and technical services to cyclone-fired and other boiler users, but its primary purpose is to place into operation facilities that produce and sell RC that lower emissions and therefore qualifies for Section 45 tax credits. NexGen Refined Coal, LLC ("NexGen") and GSFS Investments I Corp. ("GSFS"), an affiliate of The Goldman Sachs Group, Inc. ("GS"), own the remaining 42.5% and 15.0%, respectively of Tinum Group. GSFS' ownership interest is in the form of Class B units that do not have voting rights but provide certain preferences over ADA and NexGen as to liquidation and profit distribution.

The Company has determined that Tinum Group is a VIE, however, the Company does not have the power to direct the activities that most significantly impact Tinum Group's economic performance and has therefore accounted for the investment under the equity method of accounting. The Company determined the voting partners of Tinum Group have identical voting rights, equity control interests and board control interests, and therefore, concluded that the power to direct the activities that most significantly impact Tinum Group's economic performance was shared.

The following tables summarize the assets, liabilities and results of operations of Tinum Group:

<i>(in thousands)</i>	As of December 31,	
	2020	2019
Current assets	\$ 142,440	\$ 129,377
Non-current assets	\$ 28,649	\$ 124,916
Current liabilities	\$ 44,278	\$ 59,392
Non-current liabilities	\$ 5,186	\$ 13,340
Members equity attributable to Class A members	\$ 59,221	\$ 117,006
Members equity attributable to Class B members	\$ 18,769	\$ 28,967
Noncontrolling interests	\$ 43,635	\$ 35,588

<i>(in thousands)</i>	Years Ended December 31,	
	2020	2019
Gross profit	\$ 6,649	\$ 104,976
Operating, selling, general and administrative expenses	58,008	37,641
(Loss) income from operations	(51,359)	67,335
Other income (expense)	17,260	(95)
Loss attributable to noncontrolling interest	91,501	78,544
Net income available to Class A and B members	\$ 57,402	\$ 145,784
ADES equity earnings from Tinum Group	\$ 24,396	\$ 60,286

As shown above, the Company reported earnings from its equity investment in Tinum Group of \$24.4 million and \$60.3 million for the years ended December 31, 2020 and 2019, respectively.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

The carrying value of the Company's investment in Tinum Group shall be zero as long as the cumulative amount of distributions received from Tinum Group exceeds the Company's cumulative pro-rata share of Tinum Group's net income available to Class A members. For periods during which the ending balance of the Company's investment in Tinum Group is zero, the Company only recognizes equity earnings from Tinum Group to the extent that cash distributions are received from Tinum Group during the period. For periods during which the ending balance of the Company's investment is greater than zero (e.g., when the cumulative earnings in Tinum Group exceeds cumulative cash distributions received), the Company recognizes its pro-rata share of Tinum Group's net income available to Class A members for the period, less any amount necessary to recover the cumulative earnings short-fall balance as of the end of the immediately preceding period. As shown in the table below, the Company's carrying value in Tinum Group for the years ended December 31, 2020 and 2019 were \$3.4 million and \$32.3 million, respectively.

The following table presents the Company's investment balance, equity earnings, cash distributions and cash distributions in excess of the investment balance for the years ended December 31, 2019 and December 31, 2020 (*in thousands*):

Description	Date(s)	Investment balance	ADES equity earnings (loss)	Cash distributions	Memorandum Account: Cash distributions and equity loss in (excess) of investment balance
Beginning balance	12/31/2018	\$ —	\$ —	\$ —	\$ (1,672)
Impact of adoption of accounting standards ⁽¹⁾	2019 activity	37,232	—	—	—
ADES proportionate share of net income from Tinum Group	2019 activity	61,958	61,958	—	—
Recovery of cash distributions in excess of investment balance (prior to cash distributions)	2019 activity	(1,672)	(1,672)	—	1,672
Cash distributions from Tinum Group	2019 activity	(65,238)	—	65,238	—
Total investment balance, equity earnings (loss) and cash distributions	12/31/2019	\$ 32,280	\$ 60,286	\$ 65,238	\$ —
ADES proportionate share of net income from Tinum Group	2020 activity	24,396	24,396	—	—
Cash distributions from Tinum Group	2020 activity	(53,289)	—	53,289	—
Total investment balance, equity earnings and cash distributions	12/31/2020	\$ 3,387	\$ 24,396	\$ 53,289	\$ —

(1) Tinum Group adopted ASC Topic 606, *Revenue from Contracts with Customers* ("ASC 606") and ASC Topic 842, *Leases* ("ASC 842") as of January 1, 2019. As a result of Tinum Group's adoption of these standards, the Company recorded a cumulative adjustment of \$27.4 million, net of the impact of income taxes, related to the Company's percentage of Tinum Group's cumulative effect adjustment that increased the Company's Retained earnings as of January 1, 2019.

Additional information related to Tinum Group is included in Item 15 - "Exhibits and Financial Statement Schedules" ("Item 15") of this Report.

Tinum Services, LLC

In 2010, the Company, together with NexGen, formed Tinum Services for the purpose of operating and maintaining RC facilities, including those RC facilities leased or sold to third parties. The Company has determined that Tinum Services is not a VIE and has evaluated Tinum Services for potential consolidation under the voting interest model. Because the Company does not own greater than 50% of the outstanding voting shares, it has accounted for its investment in Tinum Services under the equity method of accounting. As of December 31, 2020 and 2019, the Company's investment in Tinum Services was \$4.2 million and \$6.8 million, respectively.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

The following tables summarize the assets, liabilities and results of operations of Tinum Services:

<i>(in thousands)</i>	As of December 31,	
	2020	2019
Current assets	\$ 301,670	\$ 308,249
Non-current assets	\$ 45,575	\$ 99,261
Current liabilities	\$ 187,097	\$ 155,836
Non-current liabilities	\$ 6,451	\$ 55,277
Equity	\$ 8,483	\$ 13,626
Noncontrolling interests	\$ 145,214	\$ 182,771

<i>(in thousands)</i>	Years Ended December 31,	
	2020	2019
Gross loss	\$ (87,723)	\$ (102,172)
Operating, selling, general and administrative expenses	171,095	199,691
Loss from operations	(258,818)	(301,863)
Other expenses	(1,282)	(1,422)
Loss attributable to noncontrolling interest	273,262	321,077
Net income	\$ 13,162	\$ 17,792
ADES equity earnings from Tinum Services	\$ 6,582	\$ 8,896

Included in the Consolidated Statement of Operations of Tinum Services for the years ended December 31, 2020 and 2019 were losses related to VIE entities that are consolidated within Tinum Services of \$273.3 million and \$321.1 million, respectively. These losses do not impact the Company's equity earnings from Tinum Services as 100% of those losses are attributable to a noncontrolling interest and eliminated in the calculations of Tinum Services' net income attributable to the Company's interest.

The following table details the carrying value of the Company's respective equity method investments included in the Equity method investments line item on the Consolidated Balance Sheets and indicates the Company's maximum exposure to loss:

<i>(in thousands)</i>	As of December 31,	
	2020	2019
Equity method investment in Tinum Group	\$ 3,387	\$ 32,280
Equity method investment in Tinum Services	4,242	6,813
Equity method investment in other	63	62
Total equity method investments	\$ 7,692	\$ 39,155

The Company evaluates the investments for impairment whenever events or changes in circumstances indicate that the carrying amount of the investment might not be recoverable. No impairments were recorded during the years ended December 31, 2020 and 2019.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

The following table details the components of the Company's respective earnings or loss from equity method investments included in the Earnings from equity method investments line item in the Consolidated Statements of Operations:

<i>(in thousands)</i>	Year ended December 31,	
	2020	2019
Earnings from Tinum Group	\$ 24,396	\$ 60,286
Earnings from Tinum Services	6,582	8,896
Earnings (loss) from other	—	(6)
Earnings from equity method investments	\$ 30,978	\$ 69,176

The following table details the components of the cash distributions from the Company's respective equity method investments included as a component of cash flows from operating activities in the Consolidated Statements of Cash Flows. Distributions from equity method investees are reported in the Consolidated Statements of Cash Flows as "return on investment" in Operating cash flows until such time as the carrying value in an equity method investee company is reduced to zero; thereafter, such distributions are reported as "distributions in excess of cumulative earnings" as a component of cash flows from investing activities.

<i>(in thousands)</i>	Year ended December 31,	
	2020	2019
Distributions from equity method investees, return on investment		
Tinum Group	\$ 53,289	\$ 65,238
Tinum Services	9,152	8,650
Included in Operating Cash Flows	\$ 62,441	\$ 73,888

Note 8 - Acquisition of ADA Carbon Solutions

On December 7, 2018 (the "Acquisition Date"), the Company completed the Carbon Solutions Acquisition. The Company acquired Carbon Solutions primarily to expand the Company's product offerings in the consumable air treatment markets.

The Company completed the Carbon Solutions Acquisition for a total purchase price of \$75.0 million (the "Purchase Price"). The fair value of the purchase consideration totaled \$66.5 million and consisted of cash of \$65.8 million and an additional purchase adjustment amount payable to Carbon Solutions' secured lender of \$0.7 million, which was paid in March 2019. The Purchase Price was adjusted by assumed debt and contractual commitments of \$11.8 million, and less cash acquired of \$3.3 million. The Company also paid \$4.5 million in acquisition-related costs (or transaction costs). The Company funded the cash consideration from cash on hand and the proceeds from a senior term loan facility (the "Senior Term Loan") in the principal amount of \$70.0 million, as more fully described in Note 11.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

The following table summarizes the final Purchase Price allocation. Subsequent to December 31, 2018, the Company completed additional analysis and adjustments were made to the preliminary Purchase Price allocations as noted in the table below:

Fair value of assets acquired:	As Originally Reported	Adjustments	As Adjusted
Cash	\$ 3,284	\$ —	\$ 3,284
Receivables	6,409	—	6,409
Inventories	22,100	(356)	21,744
Prepaid expenses and other current assets	2,992	61	3,053
Spare parts	3,359	—	3,359
Property, plant and equipment	43,033	(377)	42,656
Mine leases and development	2,500	200	2,700
Mine reclamation asset	—	2,402	2,402
Intangible assets	4,000	100	4,100
Other assets	168	—	168
Amount attributable to assets acquired	87,845	2,030	89,875
Fair value of liabilities assumed:			
Accounts payable	4,771	—	4,771
Accrued liabilities	7,354	254	7,608
Equipment lease liabilities	8,211	—	8,211
Mine reclamation liability	626	1,776	2,402
Other liabilities	437	—	437
Amount attributable to liabilities assumed	21,399	2,030	23,429
Net assets acquired	\$ 66,446	\$ —	\$ 66,446

Adjustments to the preliminary Purchase Price allocation primarily related to changes in fair values assigned to property, plant and equipment, intangible assets, mine reclamation liability and the related mine reclamation asset as a result of the final valuation report from the Company's third-party valuation firm issued in May 2019. During the year ended December 31, 2019 based on new information of facts and circumstances that existed as of the Acquisition Date, the Company revised its estimates used as of the Acquisition Date related to the net realizable value of certain finished goods inventory items as well as values assigned to certain prepaid and accrued expense items.

The adjustments were recorded as of June 30, 2019 and were included in the Consolidated Balance Sheet as of that date and the resultant impact to the Statement of Operations was reflected for the year ended December 31, 2019.

The following table represents the intangible assets identified as part of the Carbon Solutions Acquisition:

<i>(in thousands)</i>	Amount	Weighted Average Useful Life (years)
Customer relationships	\$ 2,200	5
Developed technology	1,600	5
Trade name	300	2
Total intangibles acquired	\$ 4,100	

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Note 9 - Inventories, net

The following table summarizes the Company's inventories recorded at the lower of average cost or net realizable value as of December 31, 2020 and 2019:

<i>(in thousands)</i>	As of December 31,	
	2020	2019
Product inventory	\$ 8,361	\$ 13,515
Raw material inventory	1,521	1,945
	<u>\$ 9,882</u>	<u>\$ 15,460</u>

Note 10 - Property, Plant and Equipment

The carrying basis and accumulated depreciation of property, plant and equipment at December 31, 2020 and 2019 are summarized in the table below:

<i>(in thousands)</i>	Life in Years	As of December 31,	
		2020	2019
Land and land improvements	0-31	\$ 891	\$ 1,764
Plant and operating equipment	1-30	25,703	44,015
Furniture and fixtures	3-11	1,259	1,201
Machinery and equipment	1-8	688	1,235
Leasehold improvements	2-3	2,089	245
Construction in progress		2,143	2,985
		<u>32,773</u>	<u>51,445</u>
Less accumulated depreciation		(3,340)	(7,444)
Total property, plant and equipment, net		<u>\$ 29,433</u>	<u>\$ 44,001</u>

Included in plant and operating equipment as of December 31, 2020 and 2019 is mining equipment financed under various lease facilities, and obligations due under these facilities are included in finance lease obligations in the Consolidated Balance Sheet. The total amount recorded for ROU assets as of December 31, 2020 and 2019 related to finance lease obligations was \$2.4 million and \$5.9 million, respectively, net of accumulated depreciation of \$0.5 million and \$2.3 million.

Depreciation expense for the years ended December 31, 2020 and 2019 was \$6.8 million and \$6.0 million, respectively.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Note 11 - Debt Obligations

<i>(in thousands)</i>	Years ended December 31,	
	2020	2019
Senior Term Loan due December 2021, related party	\$ 16,000	\$ 40,000
Less: net unamortized debt issuance costs	(465)	(1,163)
Less: net unamortized debt discount	(480)	(1,200)
Senior Term Loan due December 2021, net	15,055	37,637
PPP Loan	3,305	—
Finance lease obligations	5,526	6,729
	23,886	44,366
Less: Current maturities	(18,441)	(23,932)
Total long-term borrowings	\$ 5,445	\$ 20,434

Senior Term Loan

On December 7, 2018, the Company, and ADA-ES, Inc. ("ADA"), a wholly-owned subsidiary, and certain other subsidiaries of the Company as guarantors, The Bank of New York Mellon as administrative agent, and Apollo Credit Strategies Master Fund Ltd and Apollo A-N Credit Fund (Delaware) L.P. (collectively "Apollo"), affiliates of a beneficial owner of greater than five percent of the Company's common stock and a related party, entered into the Senior Term Loan in the amount of \$70.0 million, less original issue discount of \$2.1 million. Proceeds from the Senior Term Loan were used to fund the Carbon Solutions Acquisition as disclosed in Note 8. The Company also paid debt issuance costs of \$2.0 million related to the Senior Term Loan. The Senior Term Loan matures on December 7, 2021 and bears interest at a rate equal to 3-month LIBOR (subject to a 1.5% floor) + 4.75% per annum, which is adjusted quarterly to the current 3-month LIBOR rate, and interest is payable quarterly in arrears. Quarterly principal payments of \$6.0 million were required beginning in March 2019, and the Company may prepay the Senior Term Loan at any time without penalty. The Senior Term Loan is secured by substantially all of the assets of the Company, including the cash flows from Tinum Group and Tinum Services (collectively, the "Tinum Entities"), but excluding the Company's equity interests in the Tinum entities.

The Senior Term Loan includes, among others, the following covenants: (1) As of the end of each fiscal quarter, the Company must maintain a minimum cash balance of \$5.0 million and shall not permit "expected future net cash flows from the refined coal business" (as defined in the Senior Term Loan) to be less than 1.75 times the outstanding principal amount of the Senior Term Loan; (2) Annual collective dividends and buybacks of Company shares in an aggregate amount, not to exceed \$30.0 million, are permitted so long as (a) no default or event of default exists under the Senior Term Loan and (b) expected future net cash flows from the refined coal business as of the end of the most recent fiscal quarter exceed \$100.0 million.

Waiver and Limited Consent on Senior Term Loan

Pursuant to entering into the PPP Loan, on April 20, 2020, the Company and Apollo executed the First Amendment to the Senior Term Loan, which permitted the Company to enter into the PPP Loan.

On September 30, 2020, the Company and Apollo entered into a limited consent, which permitted the Company to (i) enter into the Surety Agreement, open the collateral bank accounts and post collateral required under the Surety Agreement, and (ii) acquire the membership interests in Marshall Mine, LLC., as described in Note 3.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

As of December 31, 2020, the following table presents the future aggregate annual maturities of the Senior Term Loan excluding unamortized discounts and deferred financing costs:

Year ended December 31, (in thousands)	Principal Amount
2021	\$ 16,000
2022	—
2023	—
2024	—
2025	—
Total	\$ 16,000

Line of Credit

In September 2013, ADA-ES, Inc. ("ADA"), a wholly-owned subsidiary of the Company, as borrower, the Company, as guarantor, entered into a line credit (the "Line of Credit") with a bank (the "Lender") for an aggregate principal amount of \$10.0 million that was secured by certain amounts due to the Company from certain Tinum Group RC leases. The Line of Credit has been amended 14 times from the period from December 2, 2013 through December 31, 2020, which included a reduction in the principal amount to \$5.0 million in September 2018.

On September 29, 2020, ADA, the Company and the "Lender entered into an amendment to the Line of Credit (the "Fourteenth Amendment"), which extended the maturity date of the Line of Credit to March 31, 2021. In addition, the Fourteenth Amendment retained covenants from the prior amendments to the Line of Credit, which included ADA's ability to enter into the Senior Term Loan as a guarantor so long as the principal amount of the Senior Term Loan did not exceed \$70.0 million and the revision of covenants that were consistent with the Senior Term Loan covenants, including maintaining a minimum cash balance of \$5.0 million.

As of December 31, 2020 and 2019, there were no outstanding borrowings under the Line of Credit.

Note 12 - Leases

As of December 31, 2020 and 2019, the Company has obligations under finance leases of \$5.5 million and \$6.7 million, respectively, and obligations under operating leases of \$3.0 million and \$5.2 million, respectively. ROU assets under finance leases are mining equipment used at the Company's lignite mine, which provides the key raw material for manufacturing the Company's products. ROU assets under operating leases are primarily plant equipment used at the Company's manufacturing facility, but also include other office equipment, vehicles and office facilities. As of December 31, 2020 and 2019, the Company has ROU assets, net of accumulated amortization, under finance leases of \$2.4 million and \$5.9 million and ROU assets, net of accumulated amortization, under operating leases of \$1.9 million and \$5.1 million, respectively.

Certain of the finance and operating leases have options permitting renewals for additional periods and buy-out options. Renewal and buy-out options for applicable leases have not been included in the measurement of the respective lease liabilities as the Company is not reasonably certain that it will exercise the respective option or the lessor does not have an exclusive right to exercise the option.

Finance leases

ROU assets under finance leases and finance lease liabilities are included in Property, plant and equipment and Current portion and Long-term portion of borrowings, respectively, in the Consolidated Balance Sheets as of December 31, 2020 and 2019.

Interest expense related to finance lease liabilities and amortization of ROU assets under finance leases are included in Interest expense and Depreciation, amortization, depletion and accretion, respectively, in the Consolidated Statement of Operations for the years ended December 31, 2020 and 2019.

Operating leases

ROU assets under operating leases and operating lease liabilities are included in Other long-term assets and Other liabilities and Other long-term liabilities, respectively, in the Consolidated Balance Sheets as of December 31, 2020 and 2019.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Lease expense for operating leases for the year ended December 31, 2020 was \$4.4 million, of which \$3.8 million is included in Consumables cost of revenue, exclusive of depreciation and amortization, and \$0.6 million is included in General and administrative in the Consolidated Statement of Operations for the year ended December 31, 2020. Lease expense for operating leases for the year ended December 31, 2019 was \$4.4 million, of which \$3.9 million is included in Consumables cost of revenue, exclusive of depreciation and amortization, and \$0.5 million is included in General and administrative in the Consolidated Statement of Operations for the year ended December 31, 2019.

In August 2019, the Company entered into a new lease agreement covering approximately 21,000 square feet of office space for a term of 3.5 years and recorded an ROU asset of \$1.2 million and a corresponding operating lease liability of \$1.2 million.

Lease financial information as of and for the years ended December 31, 2020 and 2019 is provided in the following table:

<i>(in thousands)</i>	Year ended December 31,	
	2020	2019
Finance lease cost:		
Amortization of right-of-use assets	\$ 1,471	\$ 2,149
Interest on lease liabilities	401	365
Operating lease cost	2,340	3,673
Short-term lease cost	2,067	771
Variable lease cost ⁽¹⁾	163	371
Total lease cost	\$ 6,442	\$ 7,329
Other Information:		
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from finance leases	\$ 401	\$ 365
Operating cash flows from operating leases	\$ 2,200	\$ 3,180
Financing cash flows from finance leases	\$ 1,360	\$ 1,354
Right-of-use assets obtained in exchange for new finance lease liabilities	\$ 158	\$ —
Right-of-use assets obtained in exchange for new operating lease liabilities	\$ 59	\$ 1,309
Weighted-average remaining lease term - finance leases	3.5 years	4.2 years
Weighted-average remaining lease term - operating leases	1.8 years	2.4 years
Weighted-average discount rate - finance leases	6.2 %	6.1 %
Weighted-average discount rate - operating leases	8.5 %	8.5 %

(1) Primarily includes common area maintenance, property taxes and insurance payable to lessors.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

The following table summarizes the Company's future lease payments under finance and operating leases as of December 31, 2020:

<i>(in thousands)</i>	Operating Lease Commitments	Finance Lease Commitments	Total Lease Commitments
2021	\$ 1,994	\$ 1,859	\$ 3,853
2022	748	1,008	1,756
2023	377	980	1,357
2024	—	1,928	1,928
2025	—	569	569
Thereafter	—	—	—
Total lease payments	3,119	6,344	9,463
Less: Imputed interest	(127)	(818)	(945)
Present value of lease payments	<u>\$ 2,992</u>	<u>\$ 5,526</u>	<u>\$ 8,518</u>

Note 13 - Revenues

Contract Assets and Liabilities

Contract assets are comprised of unbilled receivables and are included in Receivables, net in the Consolidated Balance Sheets. Unbilled receivables represent a conditional right to consideration in exchange for goods or services transferred to a customer.

Trade receivables represent an unconditional right to consideration in exchange for goods or services transferred to a customer. The Company invoices its customers in accordance with the terms of the contract. Credit terms are generally net 30 from the date of invoice. The timing between the satisfaction of performance obligations and when payment is due from the customer is generally not significant. The Company records allowances for doubtful trade receivables when it is probable that the balances will not be collected.

Contract liabilities are comprised of deferred revenue, which represents an obligation to transfer goods or services to a customer for which the Company has received consideration from the customer and, if deliverable within one year or less, is included in Other current liabilities in the Consolidated Balance Sheets and, if deliverable outside of one year, is included in Other long-term liabilities in the Consolidated Balance Sheets.

Trade receivables, net

The following table shows the components of Trade receivables, net:

<i>(in thousands)</i>	As of December 31,	
	2020	2019
Trade receivables	\$ 12,241	\$ 8,057
Less: Allowance for doubtful accounts	(37)	(627)
Trade receivables, net	<u>\$ 12,204</u>	<u>\$ 7,430</u>

During the years ended December 31, 2020 and 2019, the Company recognized zero and \$0.1 million, respectively, as bad debt expense related to specific accounts whose ultimate collection was in doubt.

Upfront Customer Consideration

As described in Note 3, as of September 30, 2020, the Company recorded an asset for Upfront Customer Consideration of \$7.6 million in connection with the Supply Agreement. The amount is included in Other long-term assets, net on the Company's Consolidated Balance Sheet as of December 31, 2020. The Upfront Customer Consideration is being amortized on a straight-line basis as a reduction to revenue over the expected 15-year contractual period of the Supply Agreement.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Disaggregation of Revenue and Earnings from Equity Method Investments

For the years ended December 31, 2020 and 2019, all performance obligations related to revenues recognized were satisfied at a point in time. The Company disaggregates its revenues by its major components as well as between its two operating segments, which are further discussed in Note 19 to the consolidated financial statements. The Company does not disaggregate revenue by geographic region as revenue is generated primarily from customers in the United States; however, in the APT segment for the year ended December 31, 2020, approximately 15% of APT revenue was generated in Canada. The following tables disaggregate revenues by major source for the year ended December 31, 2020 and 2019 (in thousands):

<i>(in thousands)</i>	Year ended December 31, 2020		
	Segment		
	APT	RC	Total
Revenue component			
Consumables	\$ 48,122	\$ —	\$ 48,122
License royalties, related party	—	13,440	13,440
Other	15	—	15
Revenues from customers	48,137	13,440	61,577
Earnings from equity method investments	—	30,978	30,978
Total revenues and earnings from equity method investments	\$ 48,137	\$ 44,418	\$ 92,555
<i>(in thousands)</i>	Year ended December 31, 2019		
	Segment		
	APT	RC	Total
Revenue component			
Consumables	\$ 53,187	\$ —	\$ 53,187
License royalties, related party	—	16,899	16,899
Revenues from customers	53,187	16,899	70,086
Earnings from equity method investments	—	69,176	69,176
Total revenues and earnings from equity method investments	\$ 53,187	\$ 86,075	\$ 139,262

As further discussed in Note 19, as of December 31, 2020 the Company had a change in reportable segments. The Company has recast the segment information above for the year ended December 31, 2019 to be consistent with the new reportable segments as of December 31, 2020.

Note 14 - Commitments and Contingencies

Legal Proceedings

The Company is from time to time subject to, and is presently involved in, various pending or threatened legal actions and proceedings, including those that arise in the ordinary course of its business. Such matters are subject to many uncertainties and outcomes, the financial impacts of which are not predictable with assurance and that may not be known for extended periods of time. The Company records a liability in its consolidated financial statements for costs related to claims, settlements, and judgments where management has assessed that a loss is probable, and an amount can be reasonably estimated. The Company did not have any significant legal proceedings.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Restricted Cash

As of December 31, 2020, the Company had short-term restricted cash of \$5.0 million as required under a minimum cash balance requirement of a Senior Term Loan covenant, and long-term restricted cash of \$5.0 million as required under the Surety Agreement related to the Reclamation Contract.

Surety Bonds

As of December 31, 2020, the Company had outstanding surety bonds of \$36.7 million related to performance requirements under reclamation contracts associated with both the Five Forks Mine and the Marshall Mine. As of December 31, 2020, the Company had restricted cash of \$5.0 million securing the Surety Agreement and will be required to post an additional \$5.0 million of restricted cash on March 31, 2021.

Other Commitments and Contingencies

The Company also has certain limited obligations contingent upon future events in connection with the activities of Tinum Group. The Company, NexGen and two entities affiliated with NexGen have provided GSFS with limited guaranties (the "Tinum Group Party Guaranties") related to certain losses it may suffer as a result of inaccuracies or breach of representations and covenants. The Company also is a party to a contribution agreement with NexGen under which any party called upon to pay on a Tinum Group Party Guaranty is entitled to receive contribution from the other party equal to 50% of the amount paid. No liability or expense provision has been recorded by the Company related to this contingent obligation as the Company believes that it is not probable that a loss will occur with respect to Tinum Group Party Guaranties.

Note 15 - Stockholders' Equity

The Company has two classes of capital stock authorized, common stock and preferred stock, which are described as follows:

Preferred Stock

The Company's Board of Directors (the "Board") is authorized to provide out of the unissued shares of Preferred Stock and to fix the number of shares constituting a series of Preferred Stock and, with respect to each series, to fix the number of shares and designation of such series, the voting powers, if any, the preferences and relative, participating, option or other special rights, if any, and any qualifications, limitations or restrictions thereof, of the shares of such series. As of December 31, 2020 and 2019, there were no shares of Preferred Stock designated or outstanding.

Common Stock

Holders of common stock are entitled to one vote for each share held of record on all matters submitted to a vote of the stockholders. Additionally, holders of common stock are entitled to receive dividends when and if declared by the Board, subject to any statutory or contractual restrictions on payment of dividends and to any restrictions on the payment of dividends imposed by the terms of any outstanding shares of preferred stock.

Upon dissolution, liquidation or the sale of all or substantially all of the Company's assets, after payment in full of any amounts required to be paid to creditors and to the holders of preferred stock having liquidation preferences, if any, the holders of shares of common stock will be entitled to receive the Company's remaining assets for distribution on a pro rata basis.

Stock Repurchase Programs

In November 2018, the Board authorized the Company to purchase up to \$20.0 million of its outstanding common stock under a stock repurchase program (the "Stock Repurchase Program"), which was to remain in effect until December 31, 2019 unless otherwise modified by the Board. As of November 2019, \$2.9 million remained outstanding under the Stock Repurchase Program. In November 2019, the Board authorized an incremental \$7.1 million to the Stock Repurchase Program and provided that it will remain in effect until all amounts are utilized or it is otherwise modified by the Board.

For the years ended December 31, 2020 and 2019, under the Stock Repurchase Program, the Company purchased 20,613 and 533,345 shares of its common stock for cash of \$0.2 million and \$5.8 million, inclusive of commissions and fees, respectively. As of December 31, 2020, the Company had \$7.0 million remaining under the Stock Repurchase Program.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Quarterly Cash Dividend

Dividends declared to holders of the Company's common shares during the years ended December 31, 2020 and December 31, 2019 were \$4.6 million and \$18.6 million, respectively. A portion of the dividends remains accrued subsequent to the payment dates and represents dividends accumulated on nonvested shares of common stock held by employees of the Company which contain forfeitable dividend rights which are not payable until the underlying shares of common stock vest. These amounts are included in both Other current liabilities and Other long-term liabilities in the Consolidated Balance Sheets as of December 31, 2020 and 2019.

Dividends declared and paid quarterly per share on all outstanding shares of common stock for the years ended December 31, 2020 and 2019 were as follows:

	2020		2019	
	Per share	Date paid	Per share	Date paid
Dividends declared during quarter ended:				
March 31	\$ 0.25	March 10, 2020	\$ 0.25	March 7, 2019
June 30	—		0.25	June 7, 2019
September 30	—		0.25	September 6, 2019
December 31	—		0.25	December 13, 2019
	<u>\$ 0.25</u>		<u>\$ 1.00</u>	

Tax Asset Protection Plan

United States federal income tax rules, and Section 382 of the IRC in particular, could substantially limit the use of net operating losses and other tax assets if ADES experiences an "ownership change" (as defined in the IRC). In general, an ownership change occurs if there is a cumulative change in the ownership of ADES by "5 percent stockholders" that exceeds 50 percentage points over a rolling three-year period.

On May 5, 2017, the Board approved the declaration of a dividend of rights to purchase Series B Junior Participating Preferred Stock for each outstanding share of common stock as part of a tax asset protection plan (the "TAPP") designed to protect the Company's ability to utilize its net operating losses and tax credits. The TAPP is intended to act as a deterrent to any person acquiring beneficial ownership of 4.99% or more of the Company's outstanding common stock.

On April 8, 2020, the Board approved the Third Amendment to the TAPP ("Third Amendment") that amended the TAPP, as previously amended by the First and Second Amendments that were approved the Board on April 6, 2018 and April 5, 2019, respectively. The Third Amendment amended the definition of "Final Expiration Date" under the TAPP to extend the duration of the TAPP and makes associated changes in connection therewith. At the Company's 2020 annual meeting of stockholders, the Company's stockholders approved the Third Amendment, thus the Final Expiration Date will be the close of business on December 31, 2021.

Note 16 - Stock-Based Compensation

The Plans

The Company currently has incentive plans, including the Amended and Restated 2010 Non-Management Compensation and Incentive Plan, as amended (the "2010 Plan") and the 2017 Omnibus Incentive Plan (the "2017 Plan") as described below. Collectively, these plans are called the "Stock Plans" and permit the Company to issue stock-based awards, including common stock, restricted stock, stock options and other rights and benefits under the plans to employees, directors and non-employees.

The 2010 Plan - During 2010, the Company adopted the 2010 Plan which permits grants of stock awards to employees, which may be shares, rights to purchase restricted stock, bonuses of restricted stock, or other rights or benefits under the plan. The Company reserved 600,000 shares of its common stock for these purposes. The Plan was amended and restated as of July 19, 2012 to make non-material changes to assure IRC Section 409A compliance. Upon the adoption of the 2017 Plan in June 2017, the Company no longer grants any awards from the 2010 Plan.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

The 2017 Plan - During 2017, the Company adopted the 2017 Plan which permits grants of awards to employees, directors and non-employees, which may be shares, rights to purchase restricted stock, bonuses of restricted stock, or other rights or benefits under the plan. As of December 31, 2020, the Company has 1,135,112 shares of its common stock authorized for issuance under the 2017 Plan.

Expense

RSA's - Restricted Stock Awards ("RSA's") are typically granted with vesting terms of three years. The fair value of RSA's is determined based on the closing price of the Company's common stock on the authorization date of the grant multiplied by the number of shares subject to the stock award. Compensation expense for RSA's is generally recognized over the vesting term on a straight-line basis.

Stock Options - Stock options generally vest over three years or upon satisfaction of performance-based conditions and have a contractual limit of five years from the date of grant to exercise. The fair value of stock options granted is determined on the date of grant using the Black-Scholes option pricing model and the related expense is recognized on a straight-line basis over the entire vesting period. No stock options were granted during the years ended December 31, 2020 and 2019.

When options are granted, the Company uses historical data to estimate inputs used in the Black-Scholes option pricing model.

Risk-free interest rate - The risk-free interest rate for stock options granted during the period was determined by using a zero-coupon U.S. Treasury rate for the periods that coincided with the expected terms listed above.

Dividends - As historically no dividends had been paid as of the date by which grants occurred, no dividend yield was included in the calculations when the outstanding options were granted.

Expected volatility - To calculate expected volatility, the historical volatility of the Company's common stock was used.

Expected term - The Company's expected term of options was based upon historical exercise behavior and consideration of the options' vesting and contractual terms.

RSU's - Restricted Stock Units ("RSU's") are typically granted with vesting terms of one year. The fair value of RSU's is determined based on the closing price of the Company's common stock on the authorization date of the grant multiplied by the number of shares subject to the stock award. Compensation expense is generally recognized over the service period of the award on a straight-line basis.

PSU's - Performance share units ("PSU's") generally vest over three years and are based on the grantee's continuous service with the Company, performance measures or a combination of both. Each PSU represents a contingent right to receive shares of the Company's common stock if the Company meets certain performance measures over the requisite period.

Compensation expense is recognized for PSU awards on a straight-line basis over the vesting period based on the estimated fair value at the date of grant using a Monte Carlo simulation model. No PSU's were granted during the year ended December 31, 2019.

Risk-free interest rate - The risk-free interest rate for PSU's granted during the period was determined by using a zero-coupon U.S. Treasury rate for the periods that coincided with the expected terms listed above.

Dividends - As historically no dividends had been paid as of the date by which grants occurred, no dividend yield was included in the calculations.

Expected volatility - To calculate expected volatility, the historical volatility of the Company's common stock was used.

Performance period - The Company's performance period is based upon the vesting term of the Company's PSU awards.

The Company recorded the following compensation expense related to the Stock Plans:

<i>(in thousands)</i>	Years Ended December 31,	
	2020	2019
RSA expense	\$ 2,304	\$ 2,011
PSU expense	192	—
Total stock-based compensation expense	<u>\$ 2,496</u>	<u>\$ 2,011</u>

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Stock-based compensation expense related to manufacturing employees and administrative employees is included in the Consumables cost of revenue and Payroll and benefits line items, respectively, in the Consolidated Statements of Operations. Stock-based compensation expense related to non-employee directors and consultants is included in the General and administrative line item in the Consolidated Statement of Operations.

The amount of unrecognized compensation cost as of December 31, 2020, and the expected weighted-average period over which the cost will be recognized is as follows:

<i>(in thousands)</i>	As of December 31, 2020	
	Unrecognized Compensation Cost	Expected Weighted-Average Period of Recognition (in years)
RSA expense	\$ 1,788	1.60
PSU expense	117	2.19
Total unrecognized stock-based compensation expense	\$ 1,905	1.62

Activity

Restricted Stock

A summary of the status and activity of RSA's and RSU's is presented in the following table:

<i>(in thousands, except for share and per share amounts)</i>	Restricted Stock		Weighted-Average Grant Date Fair Value	
	Awards	Units	RSA's	RSU's
For the year ended December 31, 2020				
Non-vested at January 1, 2020	451,344	—	\$ 10.65	\$ —
Granted	315,383	—	\$ 5.20	\$ —
Vested	(356,394)	—	\$ 9.41	\$ —
Forfeited	(36,473)	—	\$ 10.42	\$ —
Non-vested at December 31, 2020	373,860	—	\$ 7.25	\$ —

The weighted-average grant date fair value of RSA's granted or modified during the years ended December 31, 2020 and 2019 was \$5.20 and \$11.03, respectively. The total grant-date fair value of RSA's vested during the years ended December 31, 2020 and 2019 was \$3.4 million and \$1.1 million, respectively. The aggregate intrinsic value of non-vested RSA's outstanding as of December 31, 2020 was \$2.1 million.

Stock Options

A summary of option activity under the Stock Plans is presented below:

<i>(in thousands, except for share and per share amounts)</i>	Number of Options Outstanding and Exercisable	Weighted-Average Exercise Price	Aggregate Intrinsic Value	Weighted-Average Remaining Contractual Term (in years)
For the year ended December 31, 2020				
Options outstanding at January 1, 2020	300,000	\$ 13.87		
Options granted	—	\$ —		
Options exercised	—	\$ —		
Options expired / forfeited	(300,000)	\$ 13.87		
Options outstanding at December 31, 2020	—	\$ —	\$ —	—
Options vested and exercisable at December 31, 2020	—	\$ —	\$ —	—

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

The weighted-average grant-date fair value of options vesting during the years ended December 31, 2020 and 2019 was zero and zero, respectively. The weighted-average grant-date fair value of options exercised during the year ended December 31, 2020 and 2019 was zero and \$0.6 million, respectively. The Company received proceeds of \$0.2 million from the exercise of stock options during the year ended December 31, 2019.

Cash flows resulting from excess tax benefits, if any, are classified as part of cash flows from financing activities. Excess tax benefits are realized tax benefits from tax deductions for vested RSA's and exercised options in excess of the deferred tax asset attributable to stock compensation costs for such equity awards. The Company recorded no excess tax benefits for the years ended December 31, 2020 and 2019.

PSU's

PSU's outstanding remain unvested until the third anniversary of their issuance date, at which time the actual number of vested shares will be determined based upon the actual price performances of the Company's common stock relative to a broad stock index and a peer group performance index.

A summary of PSU activity for the year ended December 31, 2020 is presented below:

	Units	Weighted-Average Grant Date Fair Value	Aggregate Intrinsic Value (in thousands)	Weighted-Average Remaining Contractual Term (in years)
PSU's outstanding, December 31, 2020				
PSU's outstanding, January 1, 2020	—	\$ —		
Granted	50,127	6.17		
Vested / Settled	—	—		
Forfeited / Canceled	—	—		
PSU's outstanding, December 31, 2020	<u>50,127</u>	<u>\$ 6.17</u>	<u>\$ —</u>	<u>2.19</u>

There were no PSU's granted during the year ended December 31, 2019.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Note 17 - Supplemental Financial Information

Supplemental Balance Sheet Information

The following table summarizes the components of Prepaid expenses and other current assets and Other long-term assets, net as presented in the Consolidated Balance Sheets:

<i>(in thousands)</i>	As of December 31,	
	2020	2019
Prepaid expenses and other current assets:		
Prepaid expenses	\$ 1,690	\$ 1,708
Prepaid income taxes	1,605	4,228
Other	1,302	1,896
	\$ 4,597	\$ 7,832
Other long-term assets:		
Upfront customer consideration ⁽¹⁾	\$ 7,490	\$ —
Cabot receivable ⁽¹⁾	8,852	—
Right of use assets, operating leases, net	1,930	5,073
Spare parts, net	3,727	3,453
Mine development costs, net	4,338	7,084
Mine reclamation asset, net	1,712	2,451
Highview investment	552	552
Other long-term assets	1,388	1,718
	\$ 29,989	\$ 20,331

(1) See further discussion of Upfront Customer Consideration in Note 3 and Cabot receivable in Note 4.

Spare parts include critical spares required to support plant operations. Parts and supply costs are determined using the lower of cost or estimated replacement cost. Parts are recorded as maintenance expenses in the period in which they are consumed.

Mine development costs include acquisition costs, the cost of other development work and mitigation costs related to the Five Forks Mine and are depleted over the estimated life of the related mine reserves, which is 16 years. The Company performs an evaluation of the recoverability of the carrying value of mine development costs to determine if facts and circumstances indicate that their carrying value may be impaired and if any adjustment is warranted. Mine reclamation asset represents the ARO asset related to the Five Forks Mine and is depreciated over its estimated life.

The Company holds a long-term investment (the "Highview Investment") in Highview Enterprises Limited ("Highview"), a London, England based developmental stage company specializing in power storage. In November 2014, the Company acquired an 8% ownership interest in the common stock of Highview for \$2.8 million in cash. The Company accounts for the Highview Investment as an investment recorded at cost, less impairment, plus or minus observable changes in price for identical or similar investments of the same issuer.

The Highview Investment is evaluated for indicators of impairment such as an event or change in circumstances that may have a significant adverse effect on the fair value of the investment. There were no changes to the carrying value of the Highview Investment for the years ended December 31, 2020 and 2019 as there were no indicators of impairment or observable price changes for equity issued by Highview. Since the purchase date, the Company has recognized \$2.2 million of cumulative impairment losses on the Highview Investment.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

The following table details the components of Other current liabilities and Other long-term liabilities as presented in the Consolidated Balance Sheets:

<i>(in thousands)</i>	As of December 31,	
	2020	2019
Other current liabilities:		
Current portion of operating lease obligations	\$ 1,883	\$ 2,382
Accrued interest	69	213
Income and other taxes payable	1,305	678
Current portion of mine reclamation liability	9,370	—
Other current liabilities	369	1,038
	\$ 12,996	\$ 4,311
Other long-term liabilities:		
Operating lease obligations, long-term	\$ 1,109	\$ 2,810
Mine reclamation liabilities	12,077	2,721
Other	287	229
	\$ 13,473	\$ 5,760

The Mine reclamation liability related to the Five Forks Mine is included in Other long-term liabilities. The Mine reclamation liability related to Marshall Mine, which was assumed in the Marshall Mine Acquisition is included in Other current liabilities and Other long-term liabilities. The Mine reclamation liabilities represent AROs. Changes in the AROs were as follows:

<i>(in thousands)</i>	As of December 31,	
	2020	2019
Asset retirement obligations, beginning of year	\$ 2,721	\$ 624
Asset retirement obligations assumed	21,328	1,776
Accretion	543	205
Liabilities settled	(3,565)	(78)
Changes due to scope and timing of reclamation	420	194
Asset retirement obligations, end of year	21,447	2,721
Less current portion	9,370	—
Asset retirement obligations, long-term	\$ 12,077	\$ 2,721

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Supplemental Consolidated Statements of Operations Information

Gain on Settlement

On December 29, 2020, the Company and a former customer (the "Parties") reached a settlement (the "Settlement") on various litigation matters (the "Litigation Matters") that resulted in the former customer (the "Former Customer") agreeing to pay to the Company cash of \$2.5 million (the "Settlement Amount"), which was received on January 27, 2021. This payment was in exchange for full dissolution of all claims and counterclaims that the two Parties have asserted or could have asserted against each other in the Litigation Matters, or which have arisen or may arise against each other but are presently unknown, arising out of or related to the Litigation Matters and related to any other of the Parties' business dealings, conduct and/or transactions through the date of the Settlement, including all claims for damages, fees, costs, sanctions, or any other amounts due or to become due in connection with the foregoing.

The Company applied the Settlement Amount cash proceeds to both an outstanding trade account receivable and note receivable due from the Former Customer and recognized the excess cash received as a gain on the Settlement of \$1.1 million, which is reported as a component of operating expenses in the Consolidated Statements of Operations for the year ended December 31, 2020. The gain on settlement impacted operating income for the quarterly period ended December 31, 2020.

The following table details the components of Interest expense in the Consolidated Statements of Operations:

<i>(in thousands)</i>	Years Ended December 31,	
	2020	2019
Interest on Senior Term Loan	\$ 1,708	\$ 4,112
Debt discount and debt issuance costs	1,418	1,678
453A interest	331	1,039
Other	463	345
	<u>\$ 3,920</u>	<u>\$ 7,174</u>

The following table details the components of Other in the Consolidated Statements of Operations:

<i>(in thousands)</i>	Years Ended December 31,	
	2020	2019
Interest income	\$ 127	\$ 261
Other	5	166
	<u>\$ 132</u>	<u>\$ 427</u>

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Note 18 - Income Taxes

The provision for income taxes consists of the following:

<i>(in thousands, except for rate)</i>	Years Ended December 31,	
	2020	2019
Current portion of income tax expense:		
Federal	\$ 1,666	\$ 2,133
State and other	1,354	1,211
	3,020	3,344
Deferred portion of income tax expense (benefit):		
Federal	5,068	10,491
State and other	(1,577)	(1,836)
	3,491	8,655
Total income tax expense	\$ 6,511	\$ 11,999
Effective tax rate	(47)%	25 %

Income tax expense differs from the amount that would be computed by applying the U.S. statutory federal income tax rate of 21% for the years ended December 31, 2020 and 2019 to income before income taxes as a result of the following:

<i>(in thousands)</i>	Years Ended December 31,	
	2020	2019
Federal statutory rate	\$ (2,896)	\$ 10,027
State income taxes, net of federal benefit	(410)	1,597
Permanent differences	326	286
Tax credits	(417)	(338)
Valuation allowances	9,148	(288)
Changes in tax rates	(97)	229
Stock-based compensation	285	112
Return to provision and other true-ups	572	138
UTP liability	—	236
Expense for the provision for income taxes	\$ 6,511	\$ 11,999

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Deferred income taxes are provided for the effects of temporary differences between the tax basis of an asset or liability and their reported amounts in the accompanying Consolidated Balance Sheets. These temporary differences result in taxable or deductible amounts in future years. Details of the Company's deferred tax assets and liabilities are summarized as follows:

<i>(in thousands)</i>	As of December 31,	
	2020	2019
Deferred tax assets		
Tax credits	\$ 93,874	\$ 98,541
Equity method investments	5,149	—
Net operating loss carryforwards	2,906	2,956
Intangible assets	2,765	1,574
ARO, net of reimbursements	2,167	80
Employee related liabilities	827	1,065
Other investments	548	555
Operating lease obligations	508	1,307
Inventory	—	507
Other	69	244
Total deferred tax assets	108,813	106,829
Less valuation allowance	(88,758)	(79,610)
Deferred tax assets	20,055	27,219
Less: Deferred tax liabilities		
Property and equipment and other	(7,039)	(11,087)
Equity method investments	—	(736)
Upfront customer consideration	(1,847)	—
Right of use operating lease assets	(270)	(1,301)
Inventory	(295)	—
Total deferred tax liabilities	(9,451)	(13,124)
Net deferred tax assets	\$ 10,604	\$ 14,095

Accounting for income taxes requires that companies assess whether a valuation allowance should be recorded against their deferred tax asset based on an assessment of the amount of the deferred tax asset that is “more likely than not” to be realized. Valuation allowances are established, when necessary, to reduce deferred tax assets to the amount that is more likely than not to be realized.

The Company assesses the valuation allowance recorded against deferred tax assets at each reporting date. The determination of whether a valuation allowance for deferred tax assets is appropriate requires the evaluation of positive and negative evidence that can be objectively verified. Consideration must be given to all sources of taxable income available to realize a deferred tax asset, including, as applicable, the future reversal of existing temporary differences, future taxable income forecasts exclusive of the reversal of temporary differences and carryforwards, taxable income in carryback years and tax planning strategies. In estimating taxes, the Company assesses the relative merits and risks of the appropriate tax treatment of transactions taking into account statutory, judicial, and regulatory guidance.

As of December 31, 2020, the Company concluded it is more likely than not the Company will generate sufficient taxable income within the applicable net operating loss and tax credit carry-forward periods to realize \$10.6 million of its net deferred tax assets, which resulted in an increase in the valuation allowance from December 31, 2019 of \$9.1 million. In reaching this conclusion, the Company primarily considered: (1) the future reversal of existing temporary differences; and (2) forecasts of future taxable income.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

The following table presents the approximate amount of state net operating loss carryforwards and federal tax credit carryforwards available to reduce future taxable income, along with the respective range of years that the net operating loss and tax credit carryforwards would expire if not utilized:

<i>(in thousands)</i>	As of December 31,		
	2020	Beginning expiration year	Ending expiration year
Foreign net operating loss carryforwards	\$ 656	2041	2041
State and other operating loss carryforwards	\$ 2,250	2021	2036
Federal tax credit carryforwards	\$ 93,874	2032	2040

The following table sets forth a reconciliation of the beginning and ending unrecognized tax benefits on a gross basis for the years ended December 31, 2020 and 2019:

<i>(in thousands)</i>	Years Ended December 31,	
	2020	2019
Balance as of January 1	\$ 946	\$ 54
Increases for tax positions of prior years	—	892
Balance as of December 31	\$ 946	\$ 946

Included in the balance of unrecognized tax benefits as of December 31, 2020 and December 31, 2019 is \$0.7 million of tax benefits that, if utilized, would result in an adjustment to deferred taxes.

The Company did not record any adjustments or recognize interest expense for uncertain tax positions for the years ended December 31, 2020 and 2019. Interest and penalties related to uncertain tax positions are accrued and included in the Interest expense line item in the Consolidated Statements of Operations. Additionally, the Company recognizes interest expense related to the federal tax treatment of RC facilities at Tinnuum Group in the Interest expense line item in the Consolidated Statements of Operations. Additional information related to the components of Interest expense is included in Note 17.

The Company files income tax returns in the U.S. and various states. The Company is no longer subject to U.S. federal examinations by tax authorities for years before 2017. The Company is generally no longer subject to state examinations by tax authorities for years before 2013.

Note 19 - Business Segment Information

Operating segments are defined as components of an enterprise about which separate financial information is available that is evaluated regularly by a company's chief operating decision maker ("CODM"), or a decision making group, in deciding how to allocate resources and in assessing financial performance. As of December 31, 2020, the Company's CODM was the Company's CEO. The Company's operating and reportable segments are organized by products and services provided.

As of December 31, 2020, the Company has two reportable segments: (1) Refined Coal ("RC"); and (2) Advanced Purification Technologies ("APT").

Given the downward trends in the coal-fired power generation market, the prices of competing power generation sources as well as the expected expiration of the Section 45 tax credit period as of December 31, 2021, during 2020 we initiated plans to expand our AC products and diversify into new markets. As a result, internal changes, including changes in operating structure and the method in which the Chief Operating Decision Maker ("CODM") allocates resources, resulted in the change in reportable segments. The Company has recast segment information below for the year ended December 31, 2019 to be consistent with the new reportable segments as of December 31, 2020.

The business segment measurements provided to and evaluated by the CODM are computed in accordance with the principles listed below:

- The accounting policies of the operating segments are the same as those described in the summary of significant accounting policies except as described below.
- Segment revenues include equity method earnings and losses from the Company's equity method investments.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

- Segment operating income (loss) includes segment revenues and allocation of certain "Corporate general and administrative expenses," which includes Payroll and benefits, General and administrative, and Depreciation, amortization, depletion and accretion.
- RC segment operating income includes interest expense directly attributable to the RC segment.

As of December 31, 2020 and 2019, substantially all of the Company's material assets are located in the U.S. and all significant customers are U.S. companies. The following table presents the Company's operating segment results for the years ended December 31, 2020 and 2019:

<i>(in thousands)</i>	Years Ended December 31,	
	2020	2019
Revenues:		
Refined Coal:		
Earnings in equity method investments	\$ 30,978	\$ 69,176
License royalties, related party	13,440	16,899
	44,418	86,075
Advanced Purification Technologies:		
Consumables	48,122	53,187
Other	15	—
	48,137	53,187
Total segment reporting revenues	92,555	139,262
Adjustments to reconcile to reported revenues:		
Earnings in equity method investments	(30,978)	(69,176)
Total reported revenues	\$ 61,577	\$ 70,086
Segment operating income (loss)		
Refined Coal ⁽¹⁾	\$ 42,689	\$ 83,471
Advanced Purification Technologies ⁽²⁾	(39,958)	(13,600)
Total segment operating income	\$ 2,731	\$ 69,871

(1) Included in RC segment operating income for the years ended December 31, 2020 and 2019 is 453A interest expense of \$0.3 million and \$1.0 million, respectively.

(2) Included in APT segment operating loss for the years ended December 31, 2020 and 2019 was \$7.9 million and \$7.2 million, respectively, of depreciation, amortization, depletion and accretion expenses on mine and plant related long-lived assets and liabilities. Included in APT segment operating loss for the year ended December 31, 2020 was an impairment charge of \$26.1 million, offset by a gain on settlement of \$1.1 million. Included in APT segment operating loss for the year ended December 31, 2019 was approximately \$5.0 million of amortization expense related to the fair value of inventory.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

A reconciliation of reportable segment operating income to the Company's consolidated net income is as follows:

<i>(in thousands)</i>	Years Ended December 31,	
	2020	2019
Total reported segment operating income	\$ 2,731	\$ 69,871
Adjustments to reconcile to (loss) income before income tax expense attributable to the Company:		
Corporate payroll and benefits	(2,866)	(2,592)
Corporate legal and professional fees	(4,954)	(7,485)
Corporate general and administrative	(5,096)	(6,836)
Corporate depreciation and amortization	(551)	(82)
Corporate interest expense, net	(3,060)	(5,767)
Other income, net	5	427
(Loss) income before income tax expense	<u>\$ (13,791)</u>	<u>\$ 47,536</u>

Corporate general and administrative expenses include certain costs that benefit the business as a whole but are not directly related to one of the Company's segments. Such costs include, but are not limited to, accounting and human resources staff, information systems costs, legal fees, facility costs, audit fees and corporate governance expenses.

A reconciliation of reportable segment assets to the Company's consolidated assets is as follows:

<i>(in thousands)</i>	As of December 31,	
	2020	2019
Assets:		
Refined Coal ⁽¹⁾	\$ 11,516	\$ 43,953
Advanced Purification Technologies ⁽²⁾	80,877	90,083
Total segment assets	92,393	134,036
Corporate ⁽³⁾	54,278	39,763
Consolidated	<u>\$ 146,671</u>	<u>\$ 173,799</u>

(1) Includes \$7.7 million and \$39.2 million of investments in equity method investees as of December 31, 2020 and 2019, respectively.

(2) Includes \$34.6 million and \$56.5 million of long-lived assets, net. Expenditures for additions to long-lived assets were \$7.3 million and \$12.6 million, respectively, for the years ended December 31, 2020 and 2019.

(3) Includes the Company's net deferred tax assets of \$10.6 million and \$14.1 million as of December 31, 2020 and 2019, respectively.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Note 20 - Fair Value Measurements

Fair Value of Financial Instruments

The carrying amounts of financial instruments, including cash and cash equivalents, accounts receivable, accounts payable, deposits and accrued expenses, approximate fair value due to the short maturity of these instruments. The carrying amounts of the Senior Term Loan and other obligations, including finance leases, approximate fair value based on credit terms and market interest rates currently available for similar instruments. Accordingly, these instruments are not presented in the table below. The following table provides the estimated fair values of the remaining financial instruments:

<i>(in thousands)</i>	As of December 31, 2020		As of December 31, 2019	
	Carrying Value	Fair Value	Carrying Value	Fair Value
Financial Instruments:				
Highview Investment	\$ 552	\$ 552	\$ 552	\$ 552
Highview Obligation	\$ 228	\$ 228	\$ 220	\$ 220

Concentration of credit risk

As of December 31, 2020, the Company's financial instruments that are exposed to concentrations of credit risk consist primarily of cash and cash equivalents. The Company holds cash and cash equivalents at three financial institutions as of December 31, 2020. If those institutions were unable to perform their obligations, the Company would be at risk regarding the amount of its cash balance in excess of the federal deposit insurance corporation limits (\$250 thousand).

Assets and Liabilities Measured at Fair Value on a Recurring Basis

As of December 31, 2020 and December 31, 2019, the Company had no material financial instruments carried and measured at fair value on a recurring basis.

Assets and Liabilities Measured at Fair Value on a Non-Recurring Basis

As disclosed in Note 3, the Company completed the asset acquisition of Marshall Mine, LLC. The estimated fair values of the assets acquired and liabilities assumed were determined based on Level 3 inputs.

As disclosed in Note 5, the Company recorded an impairment charge related to the Asset Group based on a valuation model that included an expected future discounted cash flow model using Level 3 inputs.

The Company completed the Carbon Solutions Acquisition, in which the fair value of the purchase consideration totaled \$66.5 million. The Company's estimated fair values of the assets acquired and liabilities assumed are disclosed in Note 8. The fair value measurements represent Level 3 measurements as they were based on significant inputs not observable in the market.

As noted in Note 17, the Company accounts for the Highview Investment as an investment recorded at cost, less impairment, plus or minus observable changes in price for identical or similar investments of the same issuer. Fair value measurements, if any, represent either Level 2 or Level 3 measurements.

Note 21 - Major Customers

Revenues from external customers who represent 10% or more of the Company's revenues for the years ended December 31, 2020 and 2019 were as follows:

Customer	Revenue Type	Segment(s)	Years ended December 31,	
			2020	2019
A	License royalties, related party	RC	22%	24%
B	Consumables	APT	10%	10%

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

Note 22 - Related Party Transactions

Accounts Receivable

The following table shows the Company's receivable balance associated with related parties as of December 31, 2020 and 2019:

<i>(in thousands)</i>	As of December 31,	
	2020	2019
Receivable from related party - Tinum Group	\$ 3,453	\$ 4,246

Revenues

The following table shows the income recognized with related parties during the years ended December 31, 2020 and 2019:

<i>(in thousands)</i>	Years Ended December 31,	
	2020	2019
License royalties, related party - Tinum Group	\$ 13,440	\$ 16,899

The above Tinum Group royalties are included in the License royalties, related party line in the Consolidated Statements of Operations.

Note 23 - Defined Contribution Savings Plans

The Company sponsors a qualified defined contribution savings plan (the "401(k) Plan") that allows participation by eligible employees who may defer a portion of their gross pay. The Company makes contributions to the 401(k) Plan based on percentages of an employee's eligible compensation as specified in the 401(k) Plan, and such employer contributions are in the form of cash. Prior to January 1, 2020, the Company sponsored two 401(k) Plans, which were merged effective January 1, 2020.

The following table presents the amount of the Company's contributions made to the 401(k) Plans:

<i>(in thousands)</i>	Years Ended December 31,	
	2020	2019
401(k) Plans employer contributions	\$ 484	\$ 553

Note 24 - Restructuring and Other Compensation

Restructuring

For the years ended December 31, 2020 and 2019, the Company did not record material restructuring charges.

Other Compensation

On March 27, 2020, the Company's CEO resigned from the Company effective June 30, 2020. Pursuant to a settlement agreement executed between the Company and the CEO, the Company was obligated to pay severance compensation to the CEO in the form of salary continuance, cash bonus, contingent upon the Company achieving a performance metric, healthcare benefits, RSAs and PSUs, which in the aggregate was \$1.4 million. As of June 30, 2020, the Company recorded a liability for the total severance compensation and corresponding expense under the caption "Payroll and benefits" in the Condensed Consolidated Statements of Operations.

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

A summary of the net pretax charges incurred is as follows: The following table summarizes the Company's utilization of restructuring accruals for the years ended December 31, 2020 and 2019:

<i>(in thousands)</i>	Employee Severance
Beginning accrual as of January 1, 2019	\$ 2,208
Expense provision	172
Cash payments and other	(2,051)
Change in estimates	(75)
Accrual as of December 31, 2019	254
Expense provision	1,403
Cash payments and other	(1,386)
Accrual as of December 31, 2020	<u>\$ 271</u>

For the years ended December 31, 2020 and 2019, included in the Expense provision and Cash payments and other line items in the above table is stock-based compensation of \$0.6 million and zero, respectively, resulting from the accelerated vesting of equity-based compensation awards for certain terminated employees.

Restructuring accruals related to personnel are included in the Accrued payroll and related liabilities line item in the Consolidated Balance Sheets. Restructuring expenses related to personnel are included in the Payroll and benefits and Impairment of long-lived assets line items in the Consolidated Statements of Operations.

Note 25 - Quarterly Financial Results (unaudited)

Summarized quarterly results for the two years ended December 31, 2020 and December 31, 2019 are as follows:

<i>(in thousands, except per share data)</i>	For the Quarter Ended			
	December 31, 2020	September 30, 2020	June 30, 2020	March 31, 2020
Revenues	\$ 18,360	\$ 19,471	\$ 11,483	\$ 12,263
Cost of revenues, exclusive of operating expenses shown below	10,693	15,013	7,416	11,491
Other operating expenses	6,117 (1)	7,283	35,132	9,413
Operating income (loss)	1,550	(2,825)	(31,065)	(8,641)
Earnings from equity method investments	5,019	9,518	8,168	8,273
Other expenses, net	(943)	(864)	(814)	(1,167)
Income (loss) before income tax expense	5,626	5,829	(23,711)	(1,535)
Income tax expense	5,196 (2)	854	103	358
Net income (loss)	<u>\$ 430</u>	<u>\$ 4,975</u>	<u>\$ (23,814)</u>	<u>\$ (1,893)</u>
Earnings (loss) per common share – basic	\$ 0.02	\$ 0.27	\$ (1.32)	\$ (0.11)
Earnings (loss) per common share – diluted	\$ 0.02	\$ 0.27	\$ (1.32)	\$ (0.11)
Weighted-average number of common shares outstanding				
Basic	18,109	18,093	18,014	17,932
Diluted	18,167	18,103	18,014	17,932

Advanced Emissions Solutions, Inc. and Subsidiaries
Notes to Consolidated Financial Statements

<i>(in thousands, except per share data)</i>	For the Quarter Ended			
	December 31, 2019	September 30, 2019	June 30, 2019	March 31, 2019
Revenues	\$ 16,047	\$ 19,133	\$ 15,577	\$ 19,329
Cost of revenues, exclusive of operating expenses shown below	11,104	11,939	12,292	14,108
Other operating expenses	9,630	9,585	7,545	8,776
Operating loss	(4,687)	(2,391)	(4,260)	(3,555)
Earnings from equity method investments	12,125	14,426	20,935	21,690
Other expenses, net	(1,269)	(1,517)	(1,927)	(2,034)
Income before income tax expense	6,169	10,518	14,748	16,101
Income tax (benefit) expense	(2,929) (3)	6,595	6,634	1,699
Net income	<u>\$ 9,098</u>	<u>\$ 3,923</u>	<u>\$ 8,114</u>	<u>\$ 14,402</u>
Earnings per common share – basic	\$ 0.50	\$ 0.22	\$ 0.45	\$ 0.79
Earnings per common share – diluted	\$ 0.50	\$ 0.21	\$ 0.44	\$ 0.78
Weighted-average number of common shares outstanding				
Basic	18,066	18,112	18,172	18,268
Diluted	18,275	18,339	18,377	18,433

(1) During the fourth quarter of 2020, the Company recorded a gain on settlement of 1.1 million related to the Settlement reached with the Former Customer as further described in Note 17.

(2) During the fourth quarter of 2020, the Company recorded income tax expense of \$5.2 million primarily due to an increase in the valuation allowance as of December 31, 2020 related to the Company's deferred income tax assets.

(3) During the fourth quarter of 2019, the Company recorded income tax benefit of \$2.9 million primarily due to a decrease in current income tax expense compared to current income tax recorded from the nine months ended September 30, 2019. This decrease was primarily due to a decrease in income before income tax expense for the year ended December 31, 2019 compared to the estimated annual income before income tax expense that was used in computing current income tax expense for the nine months ended September 30, 2019.

Note 26 - Subsequent Events

Unless disclosed elsewhere in the notes to the Consolidated Financial Statements, the following are the significant matters that occurred subsequent to December 31, 2020.

In February 2021, the Company entered into a 5-year supply agreement with Cabot Norit Nederland B.V., a subsidiary of Cabot Corporation ("Cabot"), to supply Cabot with lignite activated carbon products and other ADES proprietary products used for mercury removal in utility and industrial coal-fired power plants. Cabot will be the exclusive and sole reseller of the products within Europe, Turkey, the Middle East and Africa.

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

As required by Rule 13a-15(b) under the Securities Exchange Act of 1934, as amended (the “Exchange Act”), we have evaluated, under the supervision of and with the participation of our management, including our principal executive officer and principal financial officer, the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) as of the end of the period covered by this annual report. Our disclosure controls and procedures are designed to ensure that information required to be disclosed in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC’s rules and forms. Based upon this evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective as of December 31, 2020.

Management’s Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. Internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements for external purposes in accordance with generally accepted accounting principles. The Company’s internal control over financial reporting includes those policies and procedures that:

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

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

Under the supervision of, and with the participation of our management, including the principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework and criteria established in *Internal Control-Integrated Framework* in 2013, issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation, our management concluded that our internal control over financial reporting was effective as of December 31, 2020.

Changes in Internal Control Over Financial Reporting

There has been no change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) during the fourth quarter of 2020 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

PART III

Item 10. Directors, Executive Officers, and Corporate Governance

The information required by this Item is incorporated by reference to our definitive proxy statement for the Annual Meeting of Stockholders to be filed within 120 days from December 31, 2020.

Item 11. Executive Compensation

The information required by this Item is incorporated by reference to our definitive proxy statement for the Annual Meeting of Stockholders to be filed within 120 days from December 31, 2020.

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

The information required by this Item concerning security ownership of certain beneficial owners and management is incorporated by reference to our definitive proxy statement for the Annual Meeting of Stockholders to be filed within 120 days from December 31, 2020, with the exception of the following information.

Securities Authorized for Issuance under Equity Compensation Plans

We have plans under which equity awards are authorized for grant or issuance as compensation to eligible employees, consultants, and members of the Board. Our stockholders have approved these plans. See Note 16 - Stock-Based Compensation included in Item 8 of this Report for further information about the material terms of our equity compensation plans. The following table is a summary of the shares of our common stock authorized for issuance under the equity compensation plans as of December 31, 2020:

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights	Weighted-average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in the first column) (2)
Equity compensation plans approved by security holders (1)	—	\$ —	1,748,491
Equity compensation plans not approved by security holders	—	\$ —	—
Total	—		1,748,491

(1) Includes the Amended and Restated 2007 Equity Incentive Plan, as amended, the Amended and Restated 2010 Non-Management Compensation and Incentive Plan, as amended, and the 2017 Omnibus Incentive Plan.

(2) The number of securities is reduced by 373,860 shares of restricted common stock for which restrictions have not lapsed.

Item 13. Certain Relationships and Related Transactions and Director Independence

The information required by this Item is incorporated by reference to our definitive proxy statement for the Annual Meeting of Stockholders to be filed within 120 days from December 31, 2020.

Item 14. Principal Accountant Fees and Services

The information required by this Item is incorporated by reference to our definitive proxy statement for the Annual Meeting of Stockholders to be filed within 120 days from December 31, 2020.

Item 15. Exhibits and Financial Statement Schedules

- (a) The following consolidated financial statements of Advanced Emissions Solutions, Inc. are filed as part of this Report under Item 8:
- (1) Financial Statements – see Index to Consolidated Financial Statements in Item 8;
 - (2) Financial Statement Schedules – All schedules are omitted because the required information is not applicable or is not present in amounts sufficient to require submission of the schedule or because the information required is included in the Consolidated Financial Statements and Notes thereto; and
 - (3) Exhibits – Those exhibits required by Item 601 of Regulation S-K and by paragraph (b) below.
- (b) The following exhibits are filed as part of this Report or, where indicated, were heretofore filed and are hereby incorporated by reference:

Exhibit No.	Description	Form	File No.	Incorporated by Reference Exhibit	Filing Date
3.1	Second Amended and Restated Certificate of Incorporation of Advanced Emissions Solutions, Inc.	10-Q	000-54992	3.1	August 9, 2013
3.2	Conformed Copy of the Bylaws of Advanced Emissions Solutions, Inc., as amended	10-K	001-37822	3.2	March 12, 2018
3.3	Certificate of Designation, Preferences, and Rights of Series B Junior Participating Preferred Stock of Advanced Emissions Solutions, Inc.	8-K	001-37822	3.1	May 8, 2017
4.1	Form of Specimen Common Stock Certificate	10-Q	000-54992	4.1	August 9, 2013
4.2	Tax Asset Protection Plan dated as of May 5, 2017, by and between the Company and Computershare Trust Company, N.A., as rights agent, which includes as Exhibit B the Form of Rights Certificate	8-K	001-37822	3.2	May 8, 2017
4.3	First Amendment to Tax Asset Protection Plan dated as of April 6, 2018, by and between the Company and Computershare Trust Company, N.A., as rights agent	8-K	001-37822	4.2	April 11, 2018
4.4	Second Amendment to Tax Asset Protection Plan dated as of April 5, 2019, by and between the Company and Computershare Trust Company, N.A., as rights agent	8-K	001-37822	4.3	April 11, 2019
4.5	Third Amendment to Tax Asset Protection Plan dated as of April 8, 2020, by and between the Company and Computershare Trust Company, N.A., as rights agent	8-K	001-37822	4.4	April 9, 2020
10.1	Advanced Emissions Solutions, Inc. 2017 Omnibus Incentive Plan**	8-K	001-37822	10.1	June 22, 2017
10.2	Form of Employment Agreement dated August 27, 2014, among L. Heath Sampson, ADA-ES, Inc. and Advanced Emissions Solutions, Inc., as amended**	10-K	000-54992	10.19	February 29, 2016
10.3	Rider to Employment Agreement dated August 27, 2014 between Heath Sampson and ADA-ES, Inc. and Advanced Emissions Solutions, Inc.**	8-K	000-54992	10.66	September 2, 2014
10.4	Form of Amendment No. 2 to Employment Agreement of Greg Marken and Theodore Sanders**	10-Q	001-37822	10.1	August 6, 2018
10.5	Employment Agreement dated May 7, 2020, between the Company and Christine Bellino**	8-K	001-37822	10.1	May 11, 2020
10.6	Release of Claims and Separation Agreement dated as of June 30, 2020, between the Company and Heath Sampson	10-Q	001-37822	10.3	August 10, 2020
10.7	Advisor Services Agreement dated as of July 1, 2020, between the Company and Heath Sampson	10-Q	001-37822	10.4	August 10, 2020
10.8	Employment Agreement dated February 26, 2021 between the Company and Morgan Fields**	8-K	001-37822	10.1	March 3, 2021

Exhibit No.	Description	Form	File No.	Incorporated by Reference Exhibit	Filing Date
10.9	Second Amended and Restated Operating Agreement of Clean Coal Solutions, LLC dated May 27, 2011, by and among Clean Coal Solutions, LLC, ADA-ES, Inc., GSFS Investments I Corp. and NexGen Refined Coal, LLC***	10-Q/A	000-50216	10.33	September 28, 2011
10.10	The First Amendment to the Second Amended and Restated Operating Agreement of Clean Coal Solutions, LLC, by and among Clean Coal Solutions, LLC, ADA-ES, Inc., GSFS Investments I Corp. and NexGen Refined Coal, LLC dated September 9, 2011	10-Q	000-50216	10.89	November 14, 2011
10.11	Second Amendment to the Second Amended and Restated Operating Agreement of Clean Coal Solutions, LLC by and among ADA-ES, Inc., NexGen Refined Coal, LLC and GSFS Investments I Corp. dated July 31, 2012	10-Q	000-50216	10.59	November 9, 2012
10.12	Contribution Agreement dated May 27, 2011 between ADA-ES, Inc. and NexGen Refined Coal, LLC	10-Q	000-50216	10.87	August 12, 2011
10.13	Amended and Restated Limited Liability Company Operating Agreement by and between ADA-ES, Inc., NexGen Refined Coal, LLC and Clean Coal Solutions Services, LLC dated November 20, 2013	10-K	000-54992	10.38	February 29, 2016
10.14	Amended and Restated License Agreement between ADA-ES, Inc. and Clean Coal Solutions, LLC dated October 30, 2009	10-Q	000-50216	10.77	August 16, 2010
10.15	First Amendment to the Amended and Restated License Agreement between ADA-ES, Inc. and Clean Coal Solutions, LLC dated as of August 4, 2010	10-K	000-50216	10.81	March 28, 2011
10.16	Second Amendment to Amended and Restated License Agreement by and between ADA-ES, Inc. and Clean Coal Solutions, LLC dated as of July 23, 2013***	10-Q	000-54992	10.63	November 12, 2013
10.17	Technology Sublicense Agreement between ADA-ES, Inc., Clean Coal Solutions, LLC, and GS RC Investments LLC dated June 29, 2010	10-Q	000-50216	10.74	August 16, 2010
10.18	Amendment to Technology Sublicense Agreement between ADA-ES, Inc., GS RC Investments, LLC, and Clean Coal Solutions, LLC dated November 21, 2011***	10-K	000-54992	10.44	February 29, 2016
10.19	Amendment #2 to Technology Sublicense Agreement between ADA-ES, Inc., GS RC Investments, LLC, and Clean Coal Solutions, LLC dated December 15, 2011	10-K	000-50216	10.49	March 15, 2012
10.20	Exclusive Right to Lease Agreement dated May 27, 2011 between Clean Coal Solutions, LLC and GSFS Investments I Corp***	10-Q/A	000-50216	10.84	September 28, 2011
10.21	ADA-ES, Inc. Limited Guaranty for the benefit of GSFS Investments I Corp. dated May 27, 2011	10-Q	000-50216	10.86	August 12, 2011
10.22	ADA-ES, Inc. Limited Guaranty for the benefit of GS RC Investments LLC dated November 21, 2011	10-K	000-50216	10.44	March 15, 2012
10.23	ADA-ES, Inc. Limited Guaranty for the benefit of GS RC Investments LLC dated December 15, 2011	10-K	000-50216	10.50	March 15, 2012
10.24	M-45 Technology License Agreement between ADA-ES, Inc. and Clean Coal Solutions, LLC dated July 27, 2012***	10-Q	000-50216	10.58	November 9, 2012
10.25	Undertaking and Assumption Agreement by and among Advanced Emissions Solutions, Inc., ADA-ES, Inc., and ADA Environmental Solutions, LLC dated as of July 1, 2013	10-Q	000-54992	10.62	November 12, 2013
10.26	2013 Loan and Security Agreement by and among ADA-ES, Inc., Advanced Emissions Solutions, Inc., and CoBiz Bank d/b/a Colorado Business Bank in the State of Colorado dated as of September 19, 2013	10-K	000-54992	10.69	February 29, 2016

Exhibit No.	Description	Form	File No.	Incorporated by Reference Exhibit	Filing Date
10.27	<u>Thirteenth Amendment of 2013 Loan and Security Agreement by and among ADA-ES, Inc., Advanced Emissions Solutions, Inc., and CoBiz Bank d/b/a Colorado Business Bank in the State of Colorado dated as of December 7, 2018</u>	8-K	001-37822	10.2	December 13, 2018
10.28	<u>Fourteenth Amendment of 2013 Loan and Security Agreement by and among ADA-ES, Inc., Advanced Emissions Solutions, Inc., and BOK, NA d/b/a Bank of Oklahoma dated as of September 29, 2020</u>	8-K	001-37822	10.1	September 29, 2020
10.29	<u>Purchase and Sale Agreement by and among Energy Capital Partners I, LP, Energy Capital Partners I-A, LP, Energy Capital Partners I-B IP, LP, Energy Capital Partners I (Crowfoot IP), LP, and Carbon Solutions Management, LLC, as Sellers, and Advanced Emissions Solutions, Inc., as Purchaser, dated as of November 15, 2018</u>	8-K	001-37822	2.1	November 15, 2018
10.30	<u>Term Loan and Security Agreement among Advanced Emissions Solutions, Inc., certain subsidiaries as Guarantors, the Bank of New York Mellon as administrative agent, and Apollo dated as of December 7, 2018</u>	8-K	001-37822	10.1	December 13, 2018
10.31	<u>First Amendment to Term Loan and Security Agreement dated April 20, 2020, among the Company, the Company's Subsidiaries named therein, the Lenders named therein and The Bank of New York Mellon as administrative agent to the Lenders</u>	8-K	001-37822	10.2	April 22, 2020
10.32	<u>Lignite Mining Agreement between Demery Resources Company, L.L.C. and Five Forks Mining, LLC dated as of June 29, 2009***</u>	10-K	001-37822	10.43	March 18, 2019
10.33	<u>First Amendment to Lignite Mining Agreement between Demery Resources Company, L.L.C. and Five Forks Mining, LLC, dated as of March 22, 2017***</u>	10-K	001-37822	10.44	March 18, 2019
10.34	<u>Third Amendment to the Second Amended and Restated Operating Agreement of Tinuum Group, LLC, dated September 4, 2019***</u>	10-Q	001-37822	10.1	November 12, 2019
10.35	<u>Promissory Note of the Company dated April 21, 2020, made under the Paycheck Protection Program sponsored by the U.S. Small Business Administration through BOK, NA dba Bank of Oklahoma</u>	8-K	001-37822	10.1	April 22, 2020
10.36	<u>Master Agreement for Supply of Furnace Products between ADA Carbon Solutions, LLC and Cabot Norit Americas, Inc.***</u>	8-K	001-37822	10.1	September 30, 2020
10.37	<u>Amended and Restated Lignite Mining Agreement among Caddo Creek Resources Company, L.L.C., ADA Carbon Solutions (Operations), LLC, Marshall Mine, LLC and The North American Coal Corporation dated as of September 30, 2020***</u>	8-K	001-37822	10.2	September 30, 2020
21.1	<u>Subsidiaries of Advanced Emissions Solutions, Inc.*</u>				
23.1	<u>Consent of Moss Adams LLP*</u>				
23.2	<u>Consent of Moss Adams LLP*</u>				
31.1	<u>Certification of Principal Executive Officer of Advanced Emissions Solutions, Inc. Pursuant to 17 CFR 240.13a-14(a) or 17 CFR 240.15d-14(a)*</u>				
31.2	<u>Certification of Principal Financial Officer of Advanced Emissions Solutions, Inc. Pursuant to 17 CFR 240.13a-14(a) or 17 CFR 240.15d-14(a)*</u>				

Exhibit No.	Description	Form	File No.	Incorporated by Reference Exhibit	Filing Date
32.1	Certification of Principal Executive Officer and Principal Financial Officer of Advanced Emissions Solutions, Inc. Pursuant to 18 U.S.C Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002*				
95	Mine Safety Disclosure Exhibit*				
101	The following financial statements, formatted in XBRL: (i) Consolidated Balance Sheets as of December 31, 2020 and 2019, (ii) Consolidated Statements of Operations for the Years ended December 31, 2020 and 2019, (iii) Consolidated Statements of Changes in Stockholders' Equity for the Years ended December 31, 2020 and 2019, (iv) Consolidated Statements of Cash Flows for the Years ended December 31, 2020 and 2019; and (v) Notes to the Consolidated Financial Statements. The information in Exhibit 101 is "furnished" and not "filed" as provided in Rule 401 of Regulation S-T.				

Notes:

- * – Filed herewith.
- ** – Management contract or compensatory plan or arrangement.
- *** – Portions of this exhibit have been omitted pursuant to a request for confidential treatment. The non-public information has been separately filed with the Securities and Exchange Commission.

Filings for the Company were made under the name ADA-ES, Inc. (File No. 000-50216) prior to July 1, 2013, the effective date of our reorganization, and under the name Advanced Emissions Solutions, Inc. (File No. 000-54992) starting on July 1, 2013. Filings for the Company were made under the name Advanced Emissions Solutions, Inc. (File No. 001-37822) starting on July 6, 2016.

(c) The following financial statements are included in this report pursuant to Regulation S-X:

- (1) Tinum Group, LLC and Subsidiaries;
 - a. Consolidated Financial Statements, December 31, 2020 and 2019 (with Independent Auditors' Reports thereon);

Tinum Group, LLC and Subsidiaries
CONSOLIDATED FINANCIAL STATEMENTS
As of and for the Years Ended
December 31, 2020 and 2019

TABLE OF CONTENTS

	Page
REPORT OF INDEPENDENT AUDITORS	<u>106</u>
FINANCIAL STATEMENTS	
CONSOLIDATED BALANCE SHEETS	<u>107</u>
CONSOLIDATED STATEMENTS OF OPERATIONS	<u>109</u>
CONSOLIDATED STATEMENTS OF MEMBERS' EQUITY	<u>110</u>
CONSOLIDATED STATEMENTS OF CASH FLOWS	<u>111</u>
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS	<u>113</u>

Report of Independent Auditors

The Board of Managers and Members of
Tinuum Group, LLC

Report on the Financial Statements

We have audited the accompanying consolidated financial statements of Tinuum Group, LLC and its subsidiaries, which comprise the consolidated balance sheets as of December 31, 2020 and 2019, and the related consolidated statements of operations, members' equity, and cash flows for the years then ended, and the related notes to the financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Tinuum Group, LLC and its subsidiaries as of December 31, 2020 and 2019, and the results of their operations and their cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Emphasis of Matter Regarding Going Concern

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the consolidated financial statements, with cash inflows ending in January 2022 and with legislation to extend the production tax credit (PTC) expiration date not in process or having been passed, management has assumed the reduced emissions fuel (REF) facilities and the related PTCs will expire as scheduled by December 31, 2021, and has stated that substantial doubt exists about the Company's ability to continue as a going concern. Management's evaluation of the events and conditions and management's plans regarding these matters are also described in Note 1. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty. Our opinion is not modified with respect to this matter.

/s/ Moss Adams LLP

Denver, Colorado
March 8, 2021

ASSETS

	2020	2019
CURRENT ASSETS		
Cash and cash equivalents	\$ 50,540	\$ 44,441
Accounts receivable	8,029	6,086
Income tax receivable	5,966	904
Contract receivables – current	47,264	42,916
Contract costs – current	5,541	21,503
Inventory	13,730	11,866
Other current assets	11,370	1,661
Total current assets	142,440	129,377
Fixed assets, net	24,508	50,323
Contract receivables – long term	4,122	51,587
Contract costs – long term	—	5,226
Other assets, net	19	17,780
TOTAL ASSETS	\$ 171,089	\$ 254,293

The following table presents certain assets of the consolidated variable interest entities ("VIEs"), which are included in the Consolidated Balance Sheets above. The assets in the table below include those assets that can only be used to settle obligations of consolidated VIEs, presented on the following page, and are in excess of those obligations. Additionally, the assets in the table below include third-party assets of consolidated VIEs only and exclude intercompany balances that eliminate in consolidation.

Assets of Consolidated VIEs to be Used to Settle Obligations of Consolidated VIEs

	2020	2019
ASSETS		
Cash and cash equivalents	\$ 32,050	\$ 31,481
Accounts receivable	25	22
Income tax receivable	5,966	904
Inventory	13,724	11,840
Other current assets	403	381
Non-current assets	10,631	13,934
TOTAL ASSETS	\$ 62,799	\$ 58,562

Statement continues on the next page

TINUUM GROUP, LLC AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
As of December 31, 2020 and 2019
(in thousands)

LIABILITIES AND MEMBERS' EQUITY

	2020	2019
CURRENT LIABILITIES		
Accounts payable	\$ 6,446	\$ 5,128
Accrued liabilities	6,568	7,076
Related party payables	7,653	10,278
Deferred revenue – current	11,898	9,810
Line of credit	—	5,500
Note payable to customer – current	5,400	21,600
Secured promissory notes – current	6,313	—
Total current liabilities	44,278	59,392
Asset retirement obligations	2,070	1,449
Accrued retention compensation	3,116	—
Secured promissory notes – long term	—	6,491
Note payable to customer – long term	—	5,400
TOTAL LIABILITIES	49,464	72,732
MEMBERS' EQUITY		
Members' equity attributable to Class A Members	59,221	117,006
Member equity attributable to Class B Member	18,769	28,967
Noncontrolling interests	43,635	35,588
Total Members' equity	121,625	181,561
TOTAL LIABILITIES AND MEMBERS' EQUITY	\$ 171,089	\$ 254,293

The following table presents certain liabilities of consolidated VIEs, which are included in the Consolidated Balance Sheets above. The liabilities in the table below include third-party liabilities of consolidated VIEs only and exclude intercompany balances that eliminate in consolidation. The liabilities also exclude intercompany amounts where creditors have recourse against the general credit of Tinum Group, LLC.

Liabilities of Consolidated VIEs for Which Creditors Do Not Have Recourse Against the General Credit of Tinum Group, LLC

	2020	2019
LIABILITIES		
Accounts payable and accrued liabilities	\$ 7,859	\$ 6,745
Related party payables	3,747	5,462
Secured promissory notes	6,313	6,491
Non-current liabilities	1,670	1,091
TOTAL LIABILITIES	\$ 19,589	\$ 19,789

The accompanying notes are an integral part of the consolidated financial statements.

TINUUM GROUP, LLC AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS
For the Years Ended December 31, 2020 and 2019
(in thousands)

	2020	2019
REVENUES		
Reduced emissions and unrefined fuel	\$ 619,101	\$ 500,404
REF Facility revenues – over time	89,478	142,028
REF Facility revenues – point-in-time	(1,129)	45,608
Other	594	733
TOTAL REVENUES	708,044	688,773
COST OF SALES (exclusive of depreciation shown separately below)		
Feedstock purchases	619,101	500,404
Cost of REF facilities	(12)	11,509
Chemicals	27,496	22,521
Site and production fees	35,950	27,523
Royalties and fees	18,860	21,840
TOTAL COST OF SALES	701,395	583,797
GROSS PROFIT	6,649	104,976
OPERATING EXPENSES	11,217	8,983
IMPAIRMENT OF REF FACILITIES	2,968	—
DEPRECIATION AND AMORTIZATION EXPENSE	28,175	16,361
SELLING, GENERAL AND ADMINISTRATIVE EXPENSES	15,648	12,297
(LOSS) INCOME FROM OPERATIONS	(51,359)	67,335
OTHER (INCOME) EXPENSE		
Interest income	(1,744)	(2,526)
Other expense	655	1,674
Interest expense	1,671	482
TOTAL OTHER (INCOME) EXPENSE	582	(370)
(LOSS) INCOME BEFORE INCOME TAXES	(51,941)	67,705
Deferred tax benefit	(18,979)	(904)
Income tax expense	1,137	1,369
NET (LOSS) INCOME	(34,099)	67,240
Loss attributable to noncontrolling interests	91,501	78,544
NET INCOME AVAILABLE TO MEMBERS	\$ 57,402	\$ 145,784

The accompanying notes are an integral part of the consolidated financial statements.

TINUUM GROUP, LLC AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF MEMBERS' EQUITY
Years Ended December 31, 2020 and 2019
(in thousands)

	Class A Members	Class B Member	Non- Controlling Interests	Total Members' Equity
BALANCES, JANUARY 1, 2019	\$ 49,102	\$ 16,983	\$ 16,510	\$ 82,595
Change in accounting principle	74,463	13,141	—	87,604
Member contributions	—	—	97,622	97,622
Member distributions	(130,475)	(23,025)	—	(153,500)
Net income available to members	123,916	21,868	—	145,784
Net loss attributable to noncontrolling interests	—	—	(78,544)	(78,544)
BALANCES, DECEMBER 31, 2019	<u>117,006</u>	<u>28,967</u>	<u>35,588</u>	<u>181,561</u>
Member contributions	—	—	113,465	113,465
Member distributions	(106,577)	(18,808)	—	(125,385)
Member distributions, noncontrolling interests	—	—	(13,917)	(13,917)
Net income available to members	48,792	8,610	—	57,402
Net loss attributable to noncontrolling interests	—	—	(91,501)	(91,501)
BALANCES, DECEMBER 31, 2020	<u>\$ 59,221</u>	<u>\$ 18,769</u>	<u>\$ 43,635</u>	<u>\$ 121,625</u>

The accompanying notes are an integral part of the consolidated financial statements.

TINUUM GROUP, LLC AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
For the Years Ended December 31, 2020 and 2019
(in thousands)

	2020	2019
CASH, BEGINNING OF YEAR	\$ 44,441	\$ 26,211
CASH FLOWS FROM OPERATING ACTIVITIES		
Net (loss) income	(34,099)	67,240
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	28,175	16,361
Amortization of contract costs	21,188	871
Noncash operating lease expense	176	159
Assets sold as part of REF Facility transaction	(12)	11,509
Loss on sale of assets	264	1,803
Impairment of REF facilities	2,968	—
Loss on removal of asset retirement obligation	(194)	(129)
Accretion of asset retirement obligation	184	134
Effects of changes in operating assets and liabilities:		
Accounts receivable	(1,943)	1,188
Related party receivables	—	6,294
Income tax receivable	(5,062)	(904)
Contract receivables	43,117	(7,387)
Inventory	(1,864)	2,766
Other assets	8,047	263
Accounts payable and accrued liabilities	1,010	2,033
Accrued retention compensation	3,116	—
Payments on operating leases	(200)	(176)
Related party payables	(2,196)	1,524
Deferred revenue	2,088	(13,795)
Settlement of asset retirement obligation	—	(230)
Net cash provided by operating activities	<u>64,763</u>	<u>89,524</u>
CASH FLOWS FROM INVESTING ACTIVITIES		
Capital expenditures for fixed assets	(5,648)	(17,891)
Proceeds from sale of fixed assets	99	206
Net cash used in investing activities	<u>(5,549)</u>	<u>(17,685)</u>
CASH FLOWS FROM FINANCING ACTIVITIES		
Borrowings under line of credit	8,900	7,500
Repayments under line of credit	(14,400)	(2,000)
Borrowings (repayments) on note payable to customer	(21,600)	—
Repayments under secured promissory note	(178)	(3,231)
Contributions from noncontrolling interest members	113,465	97,622
Distributions paid to minority interest members	(13,917)	—
Distributions paid to members	(125,385)	(153,500)
Net cash used in financing activities	<u>(53,115)</u>	<u>(53,609)</u>
NET INCREASE IN CASH	<u>6,099</u>	<u>18,230</u>

The accompanying notes are an integral part of the consolidated financial statements.

TINUUM GROUP, LLC AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
For the Years Ended December 31, 2020 and 2019
(in thousands)

	2020	2019
CASH, END OF YEAR	\$ 50,540	\$ 44,441
SUPPLEMENTAL DISCLOSURES		
Cash paid for interest	\$ 1,824	\$ 389
Cash paid for taxes	1,212	1,313
NON-CASH TRANSACTIONS		
Customer note for contract costs	\$ —	\$ 27,000
Capitalized contract costs	—	600
Capital expenditures included in related party payables	429	1,951
Asset retirement obligation layer	631	370

The accompanying notes are an integral part of the consolidated financial statements.

TINUUM GROUP, LLC AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2020 and 2019
(in thousands)

NOTE 1 - SIGNIFICANT ACCOUNTING POLICIES

Tinum Group, LLC (together with its subsidiaries, "Tinum" or "TG" or the "Company") develops, manages, sells and leases facilities ("REF Facilities") used in the production and sale of reduced emissions fuel. The production and sale of reduced emissions fuel (refined coal or "REF") via these REF Facilities qualifies for production tax credits that are available under Section 45 of the Internal Revenue Code ("PTCs"). The value of the PTC is adjusted annually based on inflation adjustment factors published in the Federal Register. The 2020 and 2019 PTC rates were \$7.301 and \$7.173 per ton of REF produced, respectively.

Tinum is owned 42.5% by ADA-ES, Inc. ("ADA"), 42.5% by NexGen Refined Coal, LLC ("NexGen") (collectively, Class A Members), and 15% by GSFS Investments I Corp. ("GSFS" or the "Class B Member"). ADA, NexGen, and GSFS are collectively referred to herein as the "Members."

Tinum placed in service two REF Facilities prior to January 1, 2010 and 26 additional REF Facilities prior to January 1, 2012. Each REF Facility has demonstrated the required emissions reductions from the production of REF to qualify for PTCs. The REF produced at these REF Facilities is burned at coal-fired generation stations (the owner of which is a "Generator") and is expected to continue to qualify for PTCs for a period of 10 years following the applicable placed in service date. The two REF Facilities that were placed in service prior to January 1, 2010 no longer qualified for PTCs as of December 31, 2019. The remaining 26 REF Facilities that were placed in service prior to January 1, 2012 will no longer qualify for PTCs as of December 31, 2021.

At December 31, 2020 and 2019, respectively, 23 and 20 REF Facilities had been sold to or were under lease with third-party investors ("TP Investors") who utilize the REF Facilities to produce REF (each of these REF Facilities is owned or leased by a "Producer Entity"). Some of the Producer Entities are owned or leased exclusively by a TP Investor and some are owned or leased by a TP Investor with some ownership percentage retained by the Company. The REF Facilities are located at coal-fired generation stations throughout the United States. In instances where Tinum retains certain member interests in a Producer Entity, PTCs generated are allocated to Tinum in proportion to its member interests and are therefore available for the benefit of Tinum's Members.

Tinum Services, LLC ("TS"), operates and maintains the REF Facilities under respective operating and maintenance agreements. TS is owned 50% each by ADA and NexGen and is not consolidated with the accounts of Tinum. TP Investors of REF Facilities pay TS, subject to certain limitations, a fee for procuring certain proprietary chemical additives, an operating fee for the production of REF, and for the other operating and maintenance costs associated with running the REF Facilities.

Basis of Presentation

The accompanying consolidated financial statements are presented in accordance with accounting principles generally accepted in the United States of America ("GAAP") and include the accounts of the Company and several variable interest entities ("VIEs"), for which Tinum is the primary beneficiary. An entity is referred to as a VIE if it meets any of the following criteria outlined in Accounting Standard Codification 810 - *Consolidation* ("ASC 810"), which are: (i) the entity has equity that is insufficient to permit the entity to finance its activities without additional subordinated financial support from other parties; (ii) the entity has equity investors that, as a group, lack the characteristics of a controlling financial interest; or (iii) the entity is structured with non-substantive voting rights.

The Company consolidates a VIE when it has both the power to direct the activities that most significantly impact the VIE's economic performance and the obligation to absorb losses of the entity that could be potentially significant to the VIE (i.e., it is the primary beneficiary).

All intercompany balances and transactions have been eliminated in consolidation.

TINUUM GROUP, LLC AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2020 and 2019
(in thousands)

Going Concern

Currently, with cash inflows ending in January 2022 and with legislation to extend the PTC expiration date not in process or having been passed, management has assumed the REF Facilities and the related PTCs will expire as scheduled by December 31, 2021. To date, management has not developed an alternative business strategy and thus management currently expects that 100% of the business operations will be wound down in 2022, which decision will be subject to approval by the Members.

The Company's line of credit expired on December 31, 2020 and debt financing is no longer available.

Management has budgeted, and is planning, to reserve enough cash from the final cash inflows of 2021 and 2022 to satisfy anticipated remaining liabilities and obligations, including identified contingent liabilities that have been asserted by December 31, 2021. These cash reserves will be utilized to conduct an orderly wind down of business operations.

No new business opportunities or cash inflows are expected to occur. The only exception to management's plan would be if the U.S. Congress were to extend the PTC expiration date beyond December 31, 2021. If that event were to occur in a timely manner or prior to decommissioning of REF Facilities, management would seek to renegotiate its contracts with the various TP Investors and the host stations at which the REF Facilities are located and to continue to operate the business until the latter expiration date.

Management has concluded that these factors, in the aggregate, raise substantial doubt about the Company's ability to continue as a going concern. The consolidated financial statements have been prepared on a basis which assumes the Company will be able to continue as a going concern and contemplates the realization of assets and satisfaction of liabilities in the normal course of business, and do not include any adjustments to reflect the possible future effects on the recoverability and classification of assets or the amounts and classifications of liabilities that may result from uncertainty related to the Company's ability to continue as a going concern.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting period. Management bases its estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances. Significant estimates include the estimated contingent revenues recognized related to revenues recognized at a point-in-time, the estimated useful lives associated with REF Facilities and assumptions associated with asset retirement obligations ("ARO"). Ultimate realization of assets and settlement of liabilities in the future could differ from those estimates.

During the third quarter of 2019, the Company reevaluated the estimated useful life of its REF Facilities. As a result, the Company determined that the estimated useful life of the REF Facilities should be reduced from 20 years as originally estimated to the remainder of the 10 year period from the date the REF Facility was originally placed in service. The Company accounted for the change in the useful life of the REF Facilities as a change in accounting estimate beginning August 1, 2019. For the year ended December 31, 2019, the impact of the change in estimate resulted in a decrease in net income of \$11,644.

Cash and Cash Equivalents

The Company considers all highly liquid investments with original maturities of three months or less to be cash equivalents. The carrying value approximates fair value due to the short-term nature of these instruments. The Company maintains its cash and cash equivalents in accounts with a local financial institution. These accounts at times may exceed federally insured limits. The Company has not experienced any losses in these accounts and believes it is not exposed to any significant credit risk related to cash and cash equivalents.

Accounts Receivable

Accounts receivable consist primarily of payments due from TP Investors that own or lease the REF Facilities. The carrying amount of accounts receivable may be reduced by a valuation allowance that reflects management's best estimate of amounts

TINUUM GROUP, LLC AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2020 and 2019
(in thousands)

that will not be collected. Under the Company's agreements, interest can accrue on delinquent balances. No interest on delinquent balances was recorded for the years ended December 31, 2020 and 2019. Any allowance for doubtful accounts is based on management's assessment of the collectability of specific customer accounts and the aging of the accounts receivable. If there is a deterioration of a major customer's credit worthiness or actual defaults are higher than the historical experience, management's estimates of the recoverability of amounts due to the Company could be adversely affected. As of December 31, 2020 and 2019, no allowance for doubtful accounts was considered necessary.

Inventory

Inventory is comprised primarily of feedstock fuel and chemicals used in the production and sale of REF at REF Facilities. Inventory is valued at the lower of cost or net realizable value using the average cost method.

Fixed Assets

Fixed assets are stated at historical cost less accumulated depreciation and consist primarily of the REF Facilities and ancillary equipment, including major additions and improvements. Expenditures for major improvements are capitalized, while maintenance and repair costs that do not significantly improve the related asset or extend its useful life are charged to expense as incurred. For financial reporting purposes, depreciation is calculated using the straight-line method over the estimated useful lives of the assets ranging from 3 to 10 years.

The Company records an ARO liability equal to the fair value of the estimated cost to retire a REF Facility. The ARO liability is initially recorded in the period in which the obligation meets the definition of a liability, which is generally when a REF Facility is installed at a generation station ("Site"). The ARO liability is estimated by the Company based on legal removal requirements, historical removal experience, and anticipated future inflation rates. When the liability is initially recorded, the Company increases the carrying amount of the related long-lived asset by an amount equal to the original liability. The liability is increased over time to reflect the change in its present value, and the capitalized cost is depreciated over the useful life of the related long-lived asset. The ARO liability is removed when the Company is relieved of its removal obligation due to either completion of the removal activities at a generation station or a transfer of the responsibility for the REF Facility removal to a third-party. The Company reevaluates the adequacy of its recorded ARO liability at least annually. Actual costs of asset retirements, such as removing the REF Facility from a generation station and related site restoration, are charged against the related liability. Any difference between costs incurred upon settlement of an ARO and the recorded liability is recognized in other expense as a gain or loss in the Company's consolidated statements of operations.

Intangible Assets

Tinum has two exclusive licenses from ADA for the patented and proprietary "CyClean™" and "M-45™" technologies related to the production of REF. The patents underlying the CyClean™ technology license expire beginning in 2021; however, the license agreement includes potential future patents related to the technology. The costs associated with the exclusive CyClean™ license are included in other assets, net on the consolidated balance sheets and are being amortized over the useful economic life of the technology, or approximately 14 years, using the straight-line method. Amortization expense was \$5 for each of the years ended December 31, 2020 and 2019.

Impairment of Long-Lived Assets

The Company reviews long-lived assets for impairment whenever events or changes in circumstances indicate the carrying amount of an asset may not be recoverable. Recoverability of assets to be held and used is measured by a comparison of the carrying amount of an asset to future undiscounted net cash flows expected to be generated by the asset. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the assets exceeds the fair value of the assets. Assets to be disposed of are reported at the lower of carrying amount or fair value less costs to sell. As part of the Company's on-going monitoring of its REF Facilities, the Company evaluated the REF Facility assets for potential impairment as of December 31, 2020. Given the expiration of the original PTC period, December 31, 2021, the fact that no extension of the PTC period has been passed by Congress, and the fact that the Company does not have an expectation of additional future cash flows associated with the REF Facilities beyond the PTC period, any REF Facilities that have not been invested by TP Investors have been considered to be impaired. Impairment was assessed based upon the future

TINUUM GROUP, LLC AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2020 and 2019
(in thousands)

undiscounted cash flows of each REF Facility as compared to its net book value. As a result, the Company recognized an impairment loss of \$2,968 as of and for the year ended December 31, 2020. At December 31, 2019, there were no such impairments.

Revenue Recognition

REF Facilities

The Company identifies performance obligations by reviewing the combination of customer agreements for material distinct goods and services. Goods and services are distinct when the customer can benefit from them on their own and the promises to transfer these items are separately identifiable from other promises within the contract. When the Company is contracted to provide a single promise (an integrated system), it is treated as a single performance obligation as goods and services are provided with the same pattern of transfer. The Company has identified the provision of the technology sublicense combined with the use of the REF Facility to be a single performance obligation.

REF Facility revenues are recognized based upon the type of contract with the TP Investor. Generally, the Company has three types of contracts with customers (a) Leases, (b) Member Interest Purchase Agreements ("MIPA") and (c) Asset Purchase Agreements ("APA"). In all instances the contracts relate to the use of the REF Facility and the related sublicensed patented technology which is necessary for each Producer Entity to produce REF utilizing the REF Facility.

Depending upon the agreement, the Company may receive fixed payments or a combination of fixed and variable payments over the contract term. Variable payments are determined based upon the expected amount of REF production during the defined period. Certain prepayments are received upon execution of TP Investor agreements. Significant judgments and estimates are used in the Company's revenue policies. Throughout the revenue cycle, the Company evaluates contractual evidence, monitors performance and evaluates variable consideration changes.

For the Leases and MIPA contracts, revenue is recognized "over time" using the output method, utilizing actual REF production volumes. In these agreements where a prepayment is received, that amount is recorded as deferred revenue and is amortized into revenue in accordance with the amortization period of the respective TP Investor agreement. Contingent consideration associated with Leases or MIPAs is recorded based upon actual REF production volumes achieved, constrained by any contractual limitations or by production volumes that management estimates could occur.

Revenues recorded related to the APAs are recorded when the Company has completed delivery of the REF Facility and has transferred title and control of the REF Facility to the TP Investor. These revenues are recognized at a "point-in-time" based upon the net present value of the expected fixed purchase payments plus management's estimate of any variable payments associated with the sale. Additionally, since the payments are made quarterly over a time period exceeding one year, a financing component exists to these transactions. For the years ended December 31, 2020 and 2019, interest recorded related to these contracts was \$1,619 and \$2,346, respectively, and is recorded as interest income in the statement of operations.

As a result of the recording of APA revenues as of a point-in-time, future cash flows will be received according to the contractual payment schedules, but no future revenues, other than changes in estimates, will be recognized for these contracts. Changes in estimates for variable consideration can occur for a variety of reasons, including but not limited to (i) annual inflation adjustment factors being different from what was originally estimated and (ii) changes in actual versus expected production volumes of REF. For the year ended December 31, 2020, the impact of the change in estimate resulted in a decrease in revenues of \$1,129.

Generally, the REF Facility is collateral for the outstanding contract receivable balances recorded by Tinum. The Company recognizes a contract receivable when the Company transfers control of a REF Facility to the customer in advance of receiving consideration. Contracts with variable consideration are billed quarterly in arrears, once production volumes are known, under similar payment terms.

TINUUM GROUP, LLC AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2020 and 2019
(in thousands)

Reduced Emissions and Unrefined Fuel

The Company's consolidated VIEs, which are Producer Entities, purchase and take title to feedstock fuel under purchase agreements with each respective Generator or other supplier of feedstock fuel. Each Producer Entity purchases chemicals from third-party vendors and applies them to the feedstock fuel to produce REF utilizing REF Facilities. The REF is sold by the Producer Entities, under REF sale agreements, to a Generator or to another third-party at the discretion of the Manager of each Producer Entity, as permitted under the applicable Generator agreements. The Company performs REF recertification or redetermination testing periodically as required by Section 45 with respect to production and sale of REF at each of its REF Facilities. During the years ended December 31, 2020 and 2019, each of the Producer Entities sold all of its REF and unrefined fuel (coal untreated but part of the REF process) to third parties that used the fuel to generate electricity and recorded such amounts as reduced emissions and unrefined fuel revenues.

Each VIE utilizes the combination of the REF Facility and the technology license to combine raw materials (feedstock coal and chemicals) to produce REF which is then sold as a separate manufactured product to its customer, the Generator. As a result, the Company recognizes both REF Facility revenues and reduced emissions and unrefined fuel on a gross basis.

An accounts receivable balance represents the Company's right to consideration that is unconditional and only the passage of time is required before payment of that consideration is due. No allowance for doubtful accounts related to accounts receivable balances or impairment of contract receivables has been recorded as of December 31, 2020 and 2019.

Deferred revenue is recognized when the Company receives consideration in advance of performance.

The Company disaggregates revenue based upon the revenue recognition methodology (over time vs. point-in-time). Taxes assessed by a governmental agency that are imposed on and concurrent with a specific revenue producing transaction collected by the Company from a customer are excluded from revenues.

Shipping and handling costs are not associated with Tinum's products and services and therefore are not included in revenues or costs of revenues. No amounts have been recorded for returns, refunds, or other similar obligations.

Income Taxes

The Company, with the consent of its Members, has elected to be taxed under applicable sections of federal and state income tax laws as a limited liability company treated as a partnership for income tax purposes. As a result of this election, no federal income taxes are incurred by the Company. Instead, the Members are liable for income taxes on their pro rata share of the Company's income, deductions, losses, and credits. In certain states, the Company is taxed based upon shareholder equity or other enterprise considerations. In these instances, the Company records and pays the applicable tax directly to the state agency. One of the Company's consolidated VIEs has elected to be a C corporation for federal and state income tax purposes. As a result, that VIE's income tax provision and related deferred tax assets and liabilities are included within the consolidated financial statements.

Deferred income taxes are provided for temporary differences arising from differences between the financial statement amount and tax basis of assets and liabilities existing at each balance sheet date, using enacted tax rates anticipated to be in effect when the related taxes are expected to be paid. A valuation allowance is established if it is more likely than not that a deferred tax asset will not be realized. The Company includes interest and penalties related to state tax as a component of income tax expense.

The Company applies the requirement of ASC 740, *Income Taxes*, related to accounting for uncertain tax positions. In January 2021, the Company was notified that one of its consolidating VIEs was selected for audit by the IRS. Tinum is the partnership representative and intends to cooperate with the IRS audit requirements.

Reclassifications

Certain reclassifications have been made to the prior years' financial statements to conform to the current year presentation. These reclassifications had no effect on previously reported results of operations or Members' equity.

TINUUM GROUP, LLC AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2020 and 2019
(in thousands)

Recent Accounting Pronouncements

Effective January 1, 2019, the Company adopted ASC 606, *Revenue from Contracts with Customers*, and ASC 842, *Leases*. As a result, the Company reassessed its revenue generating contracts and determined that the contracts previously accounted for as leases under ASC 840 no longer met the control criteria of a lease and the MIPAs and APAs, previously accounted for via analogy to ASC 840, were required to be analyzed and recorded utilizing the guidance in ASC 606. The Company recorded the cumulative effect of applying the new revenue standard as an adjustment to the opening balance of Members' equity.

The Company does not believe that there are any other new accounting pronouncements that have been issued that might have a material impact on its financial position or results of operations.

NOTE 2 - FIXED ASSETS

Reduced Emissions Fuel Facilities

Each of the REF Facilities and related components that were placed in service by the Company in 2009 and 2011 have demonstrated the qualified emissions reductions to qualify for PTCs. REF Facilities are stated at historical cost. Depreciation is calculated using the straight-line method over a 10 year period, commencing with the original placed in service date in 2009 or 2011, as appropriate. The two REF Facilities originally placed in service in 2009 were fully depreciated as of December 31, 2019.

Furniture, Fixtures and Equipment

Furniture, fixtures, and equipment is comprised of office furniture, fixtures and office equipment, including those under finance leases. These assets are recorded at cost and depreciated using the straight-line method with estimated useful lives ranging from 3 to 8 years.

The following table summarizes the components of gross and net carrying amounts for fixed assets as of December 31, 2020 and 2019:

	<u>2020</u>	<u>2019</u>
REF Facilities and related equipment	\$ 91,399	\$ 86,832
Assets associated with removal obligations	1,637	1,129
Furniture, fixtures, equipment and other	1,397	1,414
ROU assets	711	702
Accumulated depreciation	(67,668)	(39,754)
Impairment reserve	(2,968)	—
Fixed assets, net	<u>\$ 24,508</u>	<u>\$ 50,323</u>

Depreciation expense was \$28,170 and \$16,356, for the years ended December 31, 2020 and 2019, respectively.

Under the site license agreements between the Producer Entities or Tinuum and the Generators, Tinuum may be required to return the Site upon which the REF Facility is located to its original condition at the end of the applicable contract period. In instances where the applicable agreements place this responsibility on the Company, the Company has recorded a liability for an ARO equal to the fair value of the estimated cost to retire the REF Facility and return each Site to its original condition. The ARO liability was estimated by the Company using estimated and historical facility removal costs and anticipated future inflation rates. This estimated future value was discounted to its present value using the Company's credit-adjusted risk-free rate. The carrying value of the asset is depreciated on a straight-line basis over the remaining estimated life of the REF Facility asset group. The ARO liability is increased over time to reflect the change in its present value, and the capitalized cost is depreciated over the useful life of the site license. In subsequent periods, the Company is required to make adjustments to AROs based on changes in the estimated fair values of the obligations. Corresponding increases in asset book values are depreciated over the remaining useful life of the related site license. Uncertainties as to the probability, timing, or amount of cash flows associated with AROs may affect management's estimates of fair value. For the years ended December 31, 2020 and 2019, within operating expenses, the Company recorded \$184 and \$134 of accretion expense, respectively.

TINUUM GROUP, LLC AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2020 and 2019
(in thousands)

The following table describes changes to the Company's ARO liability for the years ended December 31, 2020 and 2019:

	<u>2020</u>	<u>2019</u>
Beginning balance	\$ 1,449	\$ 1,304
Liabilities incurred, net	631	370
Removal of liability	(194)	(129)
Accretion	184	134
Settlement of obligations	—	(230)
Ending balance	<u>\$ 2,070</u>	<u>\$ 1,449</u>

NOTE 3 - INVENTORY

Inventory is comprised primarily of feedstock fuel and chemicals used in the production and sale of REF at REF Facilities. The Company assesses the inventory valuation on a monthly basis and reduces the value for any obsolete inventory. No valuation allowance was considered necessary as of December 31, 2020 and 2019.

	<u>2020</u>	<u>2019</u>
Feedstock fuel	\$ 12,707	\$ 11,187
Chemicals	1,023	679
Total inventory	<u>\$ 13,730</u>	<u>\$ 11,866</u>

NOTE 4 - REVENUES

As discussed in Note 1, revenue is recognized when a performance obligation is satisfied. The Company's contracts can contain both fixed and variable components of the transaction price. Each contract is evaluated for these components and may be determined to include fixed consideration, variable consideration and financing components as part of the overall transaction price. The Company receives payments from customers based upon specific payment schedules established under each contract. Payment schedules can include a combination of prepayments, fixed payments and variable payments, based upon expected production volumes, and are generally made quarterly.

When a contract is determined to contain variable consideration, the transaction price is estimated using the expected value (i.e., the most likely amount method) to predict revenue for that contract. These variable amounts are estimated at contract inception based upon the projected REF production volumes associated with the specific Generator location. Estimated amounts are included in the transaction price to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. Estimates of variable consideration are estimated based upon contractual terms, historical experience and projected REF production volumes.

Nine and eight, respectively, of the REF Facility transactions with TP Investors are transactions with a related party as of December 31, 2020 and 2019. These transactions generally have terms that extend to the date ten years after the placed in service date for the particular REF Facility, subject to earlier termination by the TP Investor at periodic intervals or upon the occurrence of specified events.

Under the various TP Investor agreements, Tinuum has committed to provide the REF Facility and the related sublicense for a term as identified in each contract. Most of the agreements expire in 2021 or by the first quarter of 2022. Generally, payments are made quarterly to Tinuum on a net 10 to 30 days basis, in advance of the respective quarter.

The following is an estimate of the cash flows expected to be received from TP Investors through December 31, 2021, assuming no variations in estimated production volumes, no modifications of payments, non-renewals or early terminations of contracts. It is possible that future payments from TP Investors may be modified or reduced. Future REF Facility payments, including any eliminated in consolidation, are based on the estimated levels of REF production.

TINUUM GROUP, LLC AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2020 and 2019
(in thousands)

2021	\$	154,805
2022		7,515
	<u>\$</u>	<u>162,320</u>

In December 2019, the Company agreed to provide a future price concession to a significant customer. A portion of the price concession is provided via a note payable (“Customer Note”) under which the Company would make monthly principal and interest payments to the customer commencing in January 2020 and continuing through March 2021. The Customer Note was \$27,000 and the Company recorded the amount as contract costs on the consolidated balance sheet and allocated the payments to the customer as a reduction to the transaction price of the existing contracts with the customer. The reduction in the transaction price is being recorded monthly, commencing with the contract date of December 2019 through the end of the term of the payments of March 31, 2021. The reduction in the transaction price is recorded as production volumes are achieved (over time). For the years ended December 31, 2020 and 2019, the Company reduced revenues under this price concession contract by \$20,903 and \$871, respectively.

In certain instances, the Company employs outside parties to facilitate the commencement of a Lease, MIPA or APA transaction. Under these agreements, the Company typically pays the outside party a fee (“Fee”) relative to either the collection of revenues by the Company or the REF production volumes achieved. Under the Lease and MIPA transactions, any related contract costs are recorded as the production volumes or collection of revenues are achieved. These amounts are recorded as a component of cost of goods sold. Under the APA agreements, the Fees are capitalized as contract costs based on the estimated revenues recognized at the commencement of the contract and are amortized as a reduction of revenue over the period of benefit. For the years ended December 31, 2020 and 2019, Fees included in contract costs on the consolidated balance sheet were \$315 and \$600, respectively.

NOTE 5 - VARIABLE INTEREST ENTITIES

For the years ended December 31, 2020 and 2019, the Company consolidates nine and seven entities, respectively, (the “TG VIEs”) that were created as REF production companies. The operations include the purchase of feedstock fuel from a Generator, application of chemicals utilizing that Producer Entity’s REF Facility, and the subsequent sale of REF to the Generator. In all nine of the TG VIEs, CCS-AE, LLC (“CCS-AE”), a subsidiary of the Company, or another Tinum entity is the Managing Member and holds a 0.2% or 1.0% member interest, depending on the transaction. As the Managing Member of the TG VIEs, CCS-AE or Tinum directs the activities that are considered most significant to the entities. Based upon the criteria set forth in ASC 810, the Company has determined that it is the primary beneficiary in the TG VIEs for the years ended December 31, 2020 and 2019. As such, the financial results of the TG VIEs are consolidated with the results of the Company, and the results attributable to the other owners are presented as noncontrolling interests within the consolidated financial statements.

Creditors of the TG VIEs have no recourse against the general credit of the Company (outside of its member interest or specific guarantee obligations) and the assets of the Company are not collateral for any TG VIE obligations. The operations of all nine entities are financed through capital calls of the respective members in proportion to their member interests. In the event that a member defaults on a capital call request made by the Managing Member, the Managing Member may (i) withhold distributions payable to the defaulting member or sue for the amount due, and/or (ii) elect to transfer the defaulting member’s interest to a separate legal entity controlled by the Managing Member, or (iii) suspend operations of the REF Facility. In certain instances, the TP Investor has the ability to put, and Tinum has the ability to call, the other member interests at a purchase price equal to fair market value.

Under the provisions of certain of the TG VIEs’ various agreements, including the leases of REF Facilities or the partnership operations of the TG VIEs, the agreements terminate during time periods ranging from the fourth quarter of 2021 through December 31, 2022, unless terminated earlier by written consent of the members.

Under certain of the TG VIE agreements, capital call limitations exist, limiting the amount of capital calls if certain operational costs are exceeded.

TINUUM GROUP, LLC AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2020 and 2019
(in thousands)

NOTE 6 - NOTES PAYABLE

Line of Credit

In September 2019, the 2013 Revolver ("Revolver") with BOK Financial ("BOK"), was amended and replaced with the Fifth Amendment to the Revolver ("Fifth Amendment"). The Fifth Amendment expired on December 31, 2020 and was not renewed. Under the Fifth Amendment, prior to expiration, the available borrowing limit was:

	Available Borrowing Limit
For the period ending December 30, 2019 through September 29, 2020	\$ 7,000
For the period commencing September 30, 2020 through December 30, 2020	\$ 3,400
For the period after December 31, 2020	\$ —

The Fifth Amendment required any outstanding borrowings to be fully repaid for a period of fifteen consecutive days during two non-consecutive calendar quarters.

Amounts outstanding under the Fifth Amendment were repaid at the option of the Company. Any undrawn balance during the years ended December 31, 2020 and 2019, was subject to a quarterly unused facility fee in the amount of 0.826% annually. Interest on outstanding balances was payable monthly and was accrued at the greater of 5.5% per annum or the prime rate (as defined in the agreement) plus 1.0%.

The Fifth Amendment was collateralized by the assets of the Company and the equity interests and proceeds related to such equity interests of each material subsidiary owned by the Company. The Fifth Amendment was also collateralized by the Company's deposit accounts held at BOK. These accounts were not restricted by the Fifth Amendment.

Tinum was required to be in compliance with certain covenants under the Fifth Amendment, including tangible net worth as defined in the agreement. As of December 31, 2019, the Company was in compliance with the loan covenants. As of December 31, 2019, the outstanding balance on the Revolver was \$5,500.

Customer Note

As mentioned in Note 4, in December 2019, the Company agreed to provide a future price concession to a significant customer via a Customer Note. The Company makes monthly principal and interest payments to the customer. Payments commenced in January 2020 and extend through March 2021. As of December 31, 2020 and 2019, respectively, the Customer Note balance was \$5,400 and \$27,000. The Customer Note bears interest at 8% per annum.

Under the Customer Note, Tinum has agreed to maintain a Cash Reserve Account of \$3,000, to limit additional indebtedness to \$7,000 (plus amounts to finance Company insurance premiums plus a maximum of \$500 for finance leases) and to maintain compliance with certain loan covenants. At December 31, 2020 and 2019, respectively, the Company was in compliance with the Customer Note covenants.

Secured Promissory Note

In February 2014, a VIE consolidated into the consolidated financial statements of the Company, entered into an \$11,000 secured promissory note (the "Note") with a Generator from which it purchases feedstock fuel, and to which it sells reduced emissions and unrefined fuel on a monthly basis. The purpose of the Note is to finance the purchases of feedstock fuel from the Generator. The amount of principal and interest owed is dependent upon the amount of feedstock fuel purchased and reduced emissions and unrefined fuel sold between the two parties and is net settled on a monthly basis. The Note is collateralized by the feedstock fuel inventory.

The Note bears interest at a per annum rate equal to the short-term applicable federal rate announced by the IRS in December of each year. The interest rate for the years ended December 31, 2020 and 2019 was 1.60% and 2.72% per annum, respectively. Interest is payable quarterly in arrears.

All outstanding amounts owed under the Note are due and payable on the earlier of December 31, 2021 or the termination or expiration of the Feedstock Coal Purchase Agreement between the TG VIE and the Generator.

As of December 31, 2020 and 2019, respectively, the outstanding balance on the Note was \$4,327 and \$4,505 with interest payable of \$16 and \$32, respectively.

TINUUM GROUP, LLC AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2020 and 2019
(in thousands)

In June 2018, a second VIE consolidated into the consolidated financial statements of the Company, entered into an \$1,986 secured promissory note ("2018 Note") with a Generator to fund the initial purchase of feedstock fuel. The 2018 Note bears interest at a per annum rate equal to the mid-term applicable federal rate announced by the IRS in December of each year. The rate was 1.67% and 3.03% for the years ended December 31, 2020 and 2019, respectively. Interest is payable quarterly in arrears. The 2018 Note is collateralized by the feedstock fuel inventory.

All outstanding amounts owed under the 2018 Note are due and payable on the earlier of December 31, 2025, or the termination or expiration of the Feedstock Coal Purchase Agreement between the Company and the Generator.

At each of December 31, 2020 and 2019, the outstanding balance on the Note was \$1,986. Interest payable of \$3 and \$5 was recorded as of December 31, 2020 and 2019, respectively.

NOTE 7 - MEMBERS' EQUITY

Under the Class B Unit Purchase Agreement ("Class B Agreement") with GSFS, which was entered into upon the amendment and restatement of the Tinum Operating Agreement in 2011, ADA and NexGen each entered into a limited guarantee agreement under which the parties are obligated to guarantee performance by Tinum of its obligations to indemnify GSFS against certain losses it may suffer as a result of inaccuracies or breach in representations and covenants related to the Class B Agreement or REF Facilities' lease agreements with GSFS affiliates. ADA and NexGen entered into a contribution agreement where, in the event of such a breach, they have agreed to contribute their pro rata share of any amounts under the limited guarantee.

The Class B units were considered conditionally redeemable as specified in the Second Amended and Restated Operating Agreement and the Class B Agreement. Upon satisfaction of the redemption criteria in 2018, GSFS continues to own the Class B units which have no further capital call requirements and have limited voting rights. In September 2019, the Second Amended and Restated Operating Agreement was amended to eliminate the preferential redemption provisions for the Class B shares and simultaneously reallocated certain tax attributes between the Class A and B Members.

The Company had the following classes and percentages of Member units issued and outstanding at December 31, 2020 and 2019.

Class A Units (voting)	85 %
Class B Units (non-voting)	15 %

NOTE 8 - INCOME TAXES

During the years ended December 31, 2020 and 2019, the Company has concluded that there are no significant uncertain tax positions that would require recognition or disclosure in the financial statements. As of December 31, 2020, and 2019, the Company made no provision for interest or penalties related to uncertain positions.

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts for income tax purposes related to one of the Company's consolidated VIEs. Under a tax sharing agreement with the specific TP Investor of this VIE, the deferred tax assets are allocated specifically to the TP Investor and are not for the benefit of Tinum or its members. On a quarterly basis, the TP Investor provides a cash payment to the VIE for the prior quarter's tax benefits generated, generally production tax credits and net operating losses. As a result, the quarterly estimated funding is presented as an income tax receivable in the consolidated balance sheets. The income tax receivable as of December 31, 2020 and 2019, consists of:

	<u>2020</u>	<u>2019</u>
Net operating losses	\$ 1,026	\$ 287
Deferred tax liability	(21)	—
Production tax credits	4,961	617
Total deferred tax assets	<u>\$ 5,966</u>	<u>\$ 904</u>

Net operating loss carryforwards can be carried forward indefinitely and the PTCs can be carried forward for 20 years.

TINUUM GROUP, LLC AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2020 and 2019
(in thousands)

For the years ended December 31, 2020 and 2019, income tax expense (benefit) consisted of the following:

	2020	2019
Current	\$ 1,137	\$ 1,369
Deferred	(18,979)	(904)
Total income tax (benefit) expense	\$ (17,842)	\$ 465

NOTE 9 - RELATED PARTY TRANSACTIONS

During 2020 and 2019, the Company incurred expenses and capital expenditures and had amounts payable (excluding capital distributions) to and revenues recognized from the following related party entities:

	ADA	TS	GSFS Affiliates	NexGen and Affiliates
	<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>
As of December 31, 2020				
Accounts payable	\$ 3,454	\$ 4,179	\$ —	\$ 20
As of December 31, 2019				
Accounts payable	\$ 4,104	\$ 6,134	\$ 20	\$ 20
Revenues Recognized During the Year Ended				
December 31, 2020	\$ —	\$ (593)	\$ 88,243	\$ —
December 31, 2019	—	45,608	121,794	—
Expenses Incurred During the Year Ended				
December 31, 2020	\$ 13,656	\$ 16,629	\$ —	\$ 527
December 31, 2019	16,945	14,807	—	519

(a) ADA expenses include expenditures for royalties and consulting services.

(b) TS expenses include operating expenses associated with the operations of REF Facilities. TS revenues include APA point in time revenue estimates and management fee revenues from TP Investors included within the TS consolidated financial statements.

(c) GSFS affiliates revenues relate to REF Facility lease revenues recognized.

(d) NexGen and affiliates expenses include management fees and labor costs.

The Company acquires substantial amounts of fixed assets from TS. For the years ended December 31, 2020 and 2019, the Company acquired \$5,549 and \$17,951, respectively, of capital assets from its related party, TS.

NOTE 10 - COMMITMENTS

Purchase Commitments

In November 2011, Tinuum entered into a technology licensing agreement with ADA whereby Tinuum agreed to pay ADA royalties based on a percentage of operating income from REF production at REF Facilities that utilize the M-45™ technology. During the years ended December 31, 2020 and 2019, respectively, the Company recognized royalty expense under cost of sales in the amounts of \$13,440 and \$16,900, respectively.

In December 2015 the Company was assigned, by TS, a Master Supply Agreement with a chemical vendor. Under the agreement the Company had a commitment commencing January 1, 2015, for minimum purchase quantities of the specified chemical that if not achieved would require a shortfall payment amount ("Shortfall") to be paid to the vendor on a monthly

TINUUM GROUP, LLC AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2020 and 2019
(in thousands)

basis. Any Shortfall payment required would be applied to future chemical purchases once certain minimum volume levels were achieved. In 2018 an agreement was reached to further amend the Master Supply Agreement and the Company made an additional prepayment of \$8,187 resulting in a total prepaid amount of \$17,755 on deposit with the vendor as of December 31, 2019. Beginning in August 2020, the Company started utilizing the prepaid deposit balance through ongoing chemical usage. As of December 31, 2020, the balance was \$10,632, and is included within other current assets in the Company's consolidated balance sheets. The Company anticipates utilizing the prepaid deposit balance by the end of 2021.

Retention Compensation

It has been an ongoing practice of the Company to provide severance payments to employees that are involuntarily terminated for reasons other than for cause. In anticipation of the wind down of operations expected by 2022, the Company has formalized that practice into a retention compensation program. The purpose of the program is to incent employees to remain with the Company through the wind down dates necessary for the successful cessation of the Company. Certain executive employees have contracts that do not have a defined retention date but provide for severance payment provisions equivalent to one year of base salary that only become due and payable upon a decision by the Board of Managers to terminate an executive other than for cause. The potential estimated liability under these contracts is approximately \$1,000. Any executive employee who does not have an employment contract and all non-executive employees have a retention bonus agreement with a defined dollar amount that is payable by the Company upon the earlier of the Company's initiation of an involuntary termination or the employee remaining with the Company until the defined retention date within their agreement. Any employees electing to voluntarily terminate employment with the Company prior to their defined retention date will forfeit their retention bonus amount. The Company has determined these retention program costs to be reasonably estimable and probable for the year ended December 31, 2020. As a result, the Company has recognized a retention compensation liability and compensation expense of \$3,116 as of and for the year ended December 31, 2020. No amount was recognized as of December 31, 2019.

401k Profit Sharing Plan and Other Benefits

The Company offers a defined contribution and profit sharing plan (the "Plan") to employees who are over 18 years of age and have been employed by the Company for more than 30 days. Employees can deposit up to 80% of their eligible pay up to the statutory limit in the Plan. The Company contributes 3% of employees' eligible pay to the Plan as safe harbor contributions and an additional matching contribution equivalent to 50% of the first 6% of employee contributions. Company contributions charged to benefits expense was \$194 and \$186 for the years ended December 31, 2020 and 2019, respectively.

Office Lease

Tinum's ROU asset and lease liability are comprised of its lease for its corporate office space. The lease has an eight-year term that commenced in March 2014. The lease does not include renewal options that the Company expects to utilize. The Company has utilized its implicit borrowing rate of 5.75% to calculate the ROU asset and lease liabilities. Operating lease expense for each of the years ended December 31, 2020 and 2019 was \$199 and \$201 respectively. Operating leases are included in the ROU assets within fixed assets, net, and lease liabilities are included within accrued liabilities on the consolidated balance sheets. Real estate taxes and common area maintenance charges are expensed as incurred as operating expenses and are not included in the lease payments.

As of December 31, 2020, future annual lease payments under lease agreements through December 31, 2022 are as follows:

2021	\$	229
2022		236
Total lease payments		465
Less: interest expense		(27)
Present value of lease liabilities	\$	438

NOTE 11 - CONCENTRATIONS

The COVID-19 pandemic developed rapidly in 2020. Measures taken by federal and local governments to contain the virus have affected economic activity, locally as well as nationally. The Company's production of REF has to date been considered an element of power generation and therefore been considered an essential function under various government policies restricting business activity. The Company has taken a number of steps to monitor and mitigate the effects of COVID-19 on its operations

TINUUM GROUP, LLC AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2020 and 2019
(in thousands)

and customers, such as safety and health measures for its employees. At this stage, the impact on the financial and operational results has not been significant and based on the Company's experience to date this is expected to remain the case. The Company will continue to follow the applicable government policies and advice and, in parallel, the Company will continue to pursue operational modifications to allow continued REF production without jeopardizing the health of the Company's employees or those of its customers.

The Company's operations are currently dependent upon TP Investors leasing or purchasing REF Facilities. Further, under the terms of the various TP Investor agreements, the agreements may be subject to termination or modification by the TP Investor at periodic intervals or upon the occurrence of specified events which include amendments to Section 45 of the Internal Revenue Code. The termination or modification of all or a material portion of any TP Investor agreements would have a significant adverse impact on the Company's future operations and financial condition.

Additionally, the production and sale of REF is dependent upon the plant operations of specific generating stations where the REF Facilities are located. Production at these locations could be impacted by the COVID-19 pandemic, the demand for electricity, the amount of fuel burned as compared to other electricity generation fuel sources utilized by the utility to produce electricity, disruptions due to foreseen or unforeseen plant outages, or changes in government regulations related to electricity generation or coal burning activities.

Certain of the chemicals utilized by the Company to produce REF are available from a limited number of vendors in the United States. The Company's future operations may be materially and adversely affected if the Company encounters difficulty procuring these chemicals, the quality of available chemicals deteriorates or there are significant price increases for the chemicals.

NOTE 12 - SUBSEQUENT EVENTS

Management evaluated subsequent events through March 8, 2021, the date financial statements were available to be issued.

Item 16. Form 10-K Summary

None.

SIGNATURES

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

Advanced Emissions Solutions, Inc.
(Registrant)

By /s/ Greg P. Marken
Greg P. Marken
Interim Chief Executive Officer (Principal Executive Officer)

By /s/ Christine A. Bellino
Christine A. Bellino
Chief Accounting Officer (Principal Financial and Accounting Officer)

Date: March 10, 2021

Date: March 10, 2021

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

By /s/ Carol Eicher
Carol Eicher, Director

By /s/ Brian Leen
Brian Leen, Director

Date: March 10, 2021

Date: March 10, 2021

By /s/ Gilbert Li
Gilbert Li, Director

By /s/ R. Carter Pate
R. Carter Pate, Director

Date: March 10, 2021

Date: March 10, 2021

By /s/ J. Taylor Simonton
J. Taylor Simonton, Director

By /s/ L. Spencer Wells
L. Spencer Wells, Director

Date: March 10, 2021

Date: March 10, 2021



© 2021 Advanced Emissions Solutions, Inc.
All Rights Reserved.