

SPIRE CORP  
Form 10-K  
March 31, 2010

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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, 2009 or

Transition Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934  
For the transition period from \_\_\_\_\_ to \_\_\_\_\_

Commission file number: 0-12742

Spire Corporation  
(Exact name of registrant as specified in its charter)

Massachusetts  
(State or other jurisdiction of incorporation or organization)

04-2457335  
(I.R.S. Employer Identification Number)

One Patriots Park  
Bedford, Massachusetts 01730-2396  
(Address of principal executive offices)

(781) 275-6000  
(Registrant's telephone number, including area code)

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

| Title of Each Class                      | Name of Each Exchange on Which Registered |
|--|---|
| Common Stock, \$0.01 par value per share | The Nasdaq Global Market                  |

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

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes  No

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

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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 pursuant 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 the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer  Accelerated filer  Non-accelerated filer  (Do not check if a smaller reporting company) Smaller reporting company

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

Aggregate market value of the voting stock held by non-affiliates of the registrant based on the last sale price of such stock as reported by The Nasdaq Global Market on June 30, 2009: \$33,402,000

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive proxy statement for the Special Meeting in Lieu of 2010 Annual Meeting of Stockholders to be held on May 20, 2010, are incorporated by reference in Part III of this Form 10-K.

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Spire Corporation  
Form 10-K  
For the Year Ended December 31, 2009

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## FORWARD-LOOKING STATEMENTS

This Report contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the “Securities Act”), and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), which statements involve risks and uncertainties. These statements relate to our future plans, objectives, expectations and intentions. These statements may be identified by the use of words such as “may”, “could”, “would”, “should”, “will”, “expects”, “anticipates”, “intends”, “plans”, “believes”, “estimates” and similar expressions. Our actual results and timing of certain events could differ materially from those discussed in these statements. Factors that could contribute to these differences include but are not limited to, those discussed under “Item 1A. Risk Factors”, “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and elsewhere in this Report. Readers are encouraged to carefully review these risk factors. The cautionary statements made in this Report should be read as being applicable to all forward-looking statements wherever they appear in this report. We undertake no obligation to update any forward looking statements.

## PART I

### Item 1. Business

Spire Corporation (“Spire” or the “Company”) is a Massachusetts corporation incorporated in 1969. Our principal offices are located at One Patriots Park, Bedford, Massachusetts, and our phone number is (781) 275-6000. Our SEC filings are available through our website, [www.spirecorp.com](http://www.spirecorp.com). Our common stock trades on the Nasdaq Global Market under the symbol “SPIR”.

#### Principal Products and Services

##### Overview

Spire has been in the solar business for over 30 years, initially pioneering developments in solar cell technology. Currently, we develop, manufacture and market customized turnkey solutions for the solar industry, including individual pieces of manufacturing equipment and full turnkey lines for cell and module production and testing. We have been continually active in research and development, with over \$100 million of R&D conducted and 29 issued patents. This expertise has provided the platform for development of our manufacturing equipment and turnkey lines. We have equipment deployed in approximately 50 countries and have among our customers some of the world's leading solar manufacturers including: First Solar, BP Solar, Canadian Solar, Trina Solar Energy, Evergreen Solar and Solaria Energia.

As the solar market continues to expand, and photovoltaic cell and module manufacturers ramp production to meet increasing demand, they require more equipment to produce additional photovoltaic cells and modules. We believe that we are one of the world's leading suppliers of the manufacturing equipment and technology needed to produce solar photovoltaic modules. Our individual manufacturing equipment products and our SPI-Line™ integrated turnkey cell and module production lines can be scaled, customized, and automated with high throughput. These machines are designed to meet the needs of a broad customer base ranging from manufacturers relying on mostly manual processes, to some of the largest photovoltaic manufacturing companies in the world.

In addition, Spire provides photovoltaic systems for application to powering buildings with connection to the utility grid. Our systems use commercially available modules, in some cases manufactured by our turnkey module line customers. This business was re-established at Spire with the dissolution of our joint venture with Gloria Solar Co., Ltd. of Taiwan in the third quarter of 2009.

With over forty years since our incorporation and over thirty years in the solar market, we are in a good position to capitalize on the market's growth. Our total sales and revenues for 2009 increased approximately 7.6% compared to 2008.

Our Spire Semiconductor subsidiary provides semiconductor foundry services and is currently developing triple-junction gallium arsenide ("GaAs") concentrator solar cells for solar concentrator systems. This state-of-the-art semiconductor fabrication facility also provides our solar cell process technology for silicon cells. Spire Semiconductor also provides services to the consumer, medical and defense markets.

In addition to our cell and module manufacturing equipment, photovoltaic systems business and semiconductor foundry services, our biomedical business provides value-added surface treatments to manufacturers of orthopedic and other medical devices that enhance the durability, antimicrobial characteristics or other material characteristics of their products; and performs sponsored research programs into practical applications of advanced biomedical and biophotonic technologies.

The foundation for all of our business units is our industry-leading expertise in manufacturing and materials technologies. This proprietary knowledge enables us to further develop our products and services in each market we serve.

#### Sale of Medical Products Business Unit; Discontinued Operations

On December 14, 2009, we completed the sale of our medical products business unit, which develops and markets coated and uncoated hemodialysis catheters and related devices for the treatment of chronic kidney disease (the “Medical Products Business Unit”), to Bard Access Systems, Inc. (“Bard”). Accordingly, the results and assets of the Medical Products Business Unit are being presented herein as discontinued operations and assets held for sale. See Note 17 to the consolidated financial statements.

The maximum purchase price payable for the Medical Products Business Unit is \$12.5 million, including (i) \$9.4 million that was paid in cash to us at closing, (ii) \$100,000 that was paid in cash at closing to two of our employees, including Mark Little, Chief Executive Officer of Spire Biomedical, as consideration for their execution of non-competition agreements, and (iii) \$3.0 million payable in cash based on the achievement of certain milestones described below (the “Contingent Purchase Price”).

Certain of the assets were transferred to Bard at the closing, and certain other assets (the “Contingent Deferred Assets”) will be transferred to Bard upon the completion of a product recall related to such assets, which is expected to occur in the second quarter of 2010. Until the Contingent Deferred Assets are transferred by us, we will continue to manufacture and supply to Bard certain hemodialysis catheter products under the terms of a distribution agreement (the “Transition Period”). Upon the transfer of the Contingent Deferred Assets to Bard, Bard will pay \$1.5 million of the Contingent Purchase Price to us. Bard will pay up to \$1.5 million of the remaining Contingent Purchase Price to us based upon the achievement of milestones related to the manufacture and supply of certain quantities of hemodialysis catheter products under the distribution agreement. The transfer price for hemodialysis catheter products delivered to Bard under the distribution agreement will be equal to our standard costs of goods, including related overhead, without mark-up and calculated in accordance with U.S. generally accepted accounting principles.

#### Industry Overview

Solar power from photovoltaics has become one of the fastest growing industries in the world today. Key factors driving the demand for solar power include rising fossil fuel prices and environmental concerns including green house gases. As a result, businesses, governments, and consumers have become increasingly supportive of the development of solar energy. Government incentive programs are making solar power more cost competitive. Historically, the largest markets for PV systems have been in Europe and Japan with manufacturing located primarily in Europe and Asia. However, industry analysts predict that the U.S. will become one of the fastest growing markets over the next several years due to a number of factors including the extension of the tax credits and grants and tax credits from the American Recovery and Reinvestment Act or Stimulus bill.

#### Photovoltaic Module Manufacturing Overview

Photovoltaics is the direct conversion of sunlight into electricity through the use of semiconductor cells. Though various thin film and other semiconductor materials can be used, the majority of the photovoltaic systems market,

approximately 85%, uses crystalline silicon modules. Silicon modules are high efficiency and low cost and have demonstrated endurance required by systems providers. There was a shortage of silicon material prior to 2008 but now there is abundance and the price of silicon has fallen.

Crystalline solar cells and modules are produced in five basic steps: (1) polysilicon production; (2) ingot growth; (3) ingot wafering; (4) cell production; and (5) module assembly. The value chain begins with the processing of quartz sand to produce polysilicon. The resulting polysilicon is melted down and cast into ingots. The ingots are sliced into wafers. The wafers are manufactured into solar cells through an etching, doping and coating process. The solar cells are combined into



modules by testing and sorting the cells, soldering the cells into strings, transferring the strings onto a glass superstrate, laminating the structure with a back sheet, framing the module and, finally, testing the module performance.

## Products and Services

Our core business is in the solar market, where we provide individual pieces of manufacturing equipment, turnkey cell and module lines, cell supply, solar factory management services, and solar systems. Our solar business was responsible for 83% of our revenues in 2009. We also operate smaller businesses in the semiconductor and biomedical device markets, both of which derived from our core expertise in solar cell processing.

### Spire Solar

We believe that we are one of the world's leading suppliers of manufacturing equipment and technology needed to manufacture solar photovoltaic power systems. Our individual items of manufacturing equipment and our SPI-Line™ module production lines span the full photovoltaic module fabrication process, which currently include:

- Sorting solar cells into performance groups
  - Assembling and soldering strings of cells interconnected with metal ribbons or "tabs"
  - Completing the module circuit by soldering bus ribbons to connect the strings together
- Cutting polymer, fiberglass and back cover to length and assembling them with the glass and module circuit in preparation for encapsulation
  - Laminating the module assembly and curing the encapsulating polymer
- Final assembly, including edge trimming, installing an edge gasket and frame, and attaching a junction box
- Performing a high voltage isolation test to guarantee safe voltage isolation between the cell circuit and the module frame
  - Electrically testing the module performance by measuring a current-voltage curve under simulated sunlight

The fabrication of photovoltaic modules uses solar cells and module materials as input and produces functional photovoltaic modules, ready for use. We provide the necessary equipment and training for implementing these process steps for individual equipment items and for fully integrated production lines.

Our primary customers have been new entrants in the solar PV market. These entrants are primarily local manufacturers that are encouraged to produce PV modules by governmental incentive programs. We offer a turnkey solution with enabling technology to allow these companies to quickly enter into the market, or to expand existing capacity. We also sell individual equipment mostly to existing silicon module manufacturers as well as certain pieces of our module equipment to "thin film" manufacturers, specifically lamination and testing equipment. We provide full turnkey solar cell and wafer lines to customers for vertical integration. Most of the equipment used in these lines is purchased from third parties. We provide the proprietary cell line process technology.

Our solar systems business provides clients with grid-connected distributed photovoltaic systems and custom modules to meet their demand for solar electricity. The business is primarily a system design and engineering service whose team of experienced professionals offers complete project design, management, installation coordination, and customer service.

We also supply solar materials on a recurring basis under a Federal government contract. See "Unicor Relationship" below.

### Spire Semiconductor

Spire Semiconductor operates a state-of-the-art semiconductor foundry and fabrication facility in Hudson, New Hampshire, equipped with advanced and sophisticated metal-organic chemical vapor deposition ("MOCVD") reactors and fabrication equipment. Our fabrication facility has been designed with flexibility to engage in quick-turn research and prototyping, as well as for economical full-rate volume production services.

Spire Semiconductor offers double- and triple-junction gallium arsenide ("GaAs") solar cells and is working on a contract for the Department of Energy's National Renewable Energy Laboratory ("NREL") for a \$3.7 million, 20% cost share program to develop a 40%+ conversion efficiency solar cell design. GaAs concentrator cells represent a significant market opportunity and, as one of the pioneers in GaAs fabrication, we have the expertise to provide customers with turnkey

cell products. We currently have capacity for 25 MW of high efficiency solar cell production with opportunities to expand. We also have capabilities for fabricating thermo-photovoltaic ("TPV") cells.

In 2007, we invested approximately \$3.8 million in equipment which would allow us to produce optoelectronic devices on a commercial basis. This was in anticipation of future revenues under our Manufacturing Agreement with Principia Lightworks who provided a non-refundable up front payment to partially offset our investment. On March 27, 2009, we and Principia Lightworks agreed to terminate the Manufacturing Agreement. See Note 15 to the consolidated financial statements. We are using this equipment for our other customers and are performing research and development of solar concentrator cells under a Federal government contract, which we expect to be able to commercialize.

#### Spire Biomedical

Through our Spire Biomedical subsidiary, we provide advanced medical device surface treatment processes for performance improvement of orthopedic and cardiovascular devices, enhancing properties such as wear resistance, infection resistance and thromboresistance.

As noted above, we sold our catheter product line at the end of 2009 to further focus our resources on our solar business. See Note 17 to the consolidated financial statements.

#### Principal Distribution Methods

Our products and services are sold primarily by our direct, internal sales staff with two notable exceptions: (i) in certain offshore markets, we utilize independent sales representatives to aid our sales efforts to sell our solar equipment, and (ii) proposals for sponsored research and development work are prepared by our scientists and researchers.

#### Competitive Conditions

The markets in which we operate are highly competitive and characterized by changes due to technological improvements and developments. We compete with many other manufacturers and service providers in each of our product and service areas; many of these competitors have greater resources and sales. Additionally, our products and services compete with products and services utilizing alternative technologies. For example, our solar photovoltaic systems compete with other forms of renewable energy such as wind, solar thermal and geo-thermal. Price, service and product performance are significant elements of competition in the sale of each of our products. We believe that there are considerable barriers to entry into the markets we serve, including a significant investment in specialized capital equipment and product design and development, and the need for a staff with sophisticated scientific and technological knowledge.

#### Sources and Availability of Raw Materials

Principal raw materials purchased by us include polymer extrusions, molded plastic parts, silicon photovoltaic cells, compound semiconductor wafer substrates, high purity industrial gases, custom metal welded structures, fasteners, position sensors, electrical motors, electrical power conditioning inverters, and electrical controls. All of these items are available from several suppliers and we generally rely on more than one supplier for each item. Prior to the third quarter of 2008, there has been a multi-year shortage in semiconductor grade silicon leading to huge increases in the spot market prices. However, at the end of 2008 new capacity has been added and further capacity is expected to come online in 2010 given that the spot market is expected to remain above production costs for 2010. This has as resulted in a significant reduction in the cost of crystalline silicon based material. If poly-silicon production scheduled

to come on line is delayed or scaled back there is potential for a new shortage which would cause users of our equipment to either scale back or delay their expansion plans.

#### Sources and Availability of Manufacturing Services

While we have sold the Medical Products Business Unit to Bard, as noted above, we still have an obligation to supply Bard product during a Transition Period. We employ an outsourcing-model supply chain in this business by which certain manufacturing services, such as polymer extrusion, assembly, packaging and sterilization, are obtained from third party contractors. We have identified multiple potential sources for the services required; however, certain elements of the supply chain currently involve only one qualified contractor. The limits of this supply chain may limit our ability to supply certain

products to Bard during the Transition Period which may result in us not meeting certain milestones under the agreement, which could impact our ability to receive all or a portion of the Contingent Purchase Price.

#### Key Licenses and Patents, Government Rights to Intellectual Property

Through over 30 years of research and development, we have accumulated extensive scientific and technological expertise. We protect our technological advances as trade secrets, in part through confidentiality agreements with employees, consultants and third parties. We also seek and enforce patents as appropriate. We currently have 27 issued United States patents, two foreign patents and 26 patents pending in the United States, all of which cover elements of our materials and processing technologies.

The United States government retains the right to obtain a patent on any invention developed under government contracts as to which we do not seek and obtain a patent, and may require us to grant a third party license of such invention if steps to achieving practical application of the invention have not been taken. The United States government also retains a non-exclusive, royalty-free, non-transferable license to all technology developed under government contracts, whether or not patented, for government use, including use by other parties to United States government contracts. Furthermore, our United States government contracts prohibit us from granting exclusive rights to use or sell any inventions unless the grantee agrees that any product using the invention will be manufactured substantially in the United States.

#### Government Regulation of Medical Products

While we have sold the Medical Products Business Unit to Bard, as noted above, certain assets of the business will be transferred to Bard upon the completion of a product recall related to such assets, which is expected to occur in the second quarter of 2010. Until such assets are transferred by us, we will continue to manufacture and supply to Bard certain hemodialysis catheter products under the terms of a distribution agreement. Hemodialysis catheters and accessory products require the approval of the United States Food & Drug Administration (“FDA”) prior to sale within the United States. Sales within the European Union (“EU”) require the CE Mark certification and sales within Canada require a medical device license issued by Health Canada.

We currently hold all required approvals and certifications to distribute the Heparin coated and uncoated hemodialysis catheters and accessory products in the USA, and the uncoated catheters in the EU, Canada, Australia and Hong Kong.

We initiated a voluntary recall of certain catheters based upon three field complaints of catheter malfunctions received in the third quarter of 2009. No patient injury or complications resulted from the malfunction. It was determined that under certain molding conditions, there was a possibility that insufficient bonding may occur which could cause the catheter to malfunction. As it could not be isolated to a particular lot, we initiated a voluntary recall of any inventory held by our distributors and their customers. As the manufacturer of record we are responsible for ensuring that the product meets the product specifications and the associated product liability that may result in failure those specifications. Included in discontinued operations are reserves for inventory and potential returns related to a voluntary recall of medical products totaling approximately \$1.1 million in the year ended December 31, 2009. The voluntary recall was initiated in October 2009 and in February 2010 we determined that we had achieved a 100% effectiveness rating based upon the recall criteria and have submitted a request to the U.S. Food and Drug Administration requesting to close the recall action. This request is currently pending.

#### Government Regulation of Contracts

Our United States government contracts are subject to a large number of federal regulations and oversight requirements. Compliance with the array of government regulations requires extensive record keeping and the maintenance of complex policies and procedures relating to all aspects of our business, as well as to work performed

for us by any subcontractors. We believe that we have put in place systems and personnel to ensure compliance with all such federal regulations and oversight requirements. All contracts with United States government agencies have been audited by the government through December 2006. We have not incurred substantial losses as a result of these incurred cost audits.

#### Research and Development

Our policy is to support as much of our research and development as possible through government contract funding, which we recognize as revenue. Revenues from our research and development contracts and NREL funded by the United States government, and their percent of consolidated net sales and revenues were \$3.3 million, or 5%, and \$1.7 million, or 3%, for the years ended December 31, 2009 and 2008, respectively.

Our contracts with the United States government grant to us proprietary rights in any technology developed pursuant to such contracts and grant to the United States government a non-exclusive license to utilize the technology for its benefit. The United States government retains the right to pursue patent protection on any inventions made under these contracts as to which patent protection is not sought and obtained by us. To date, the Government has not exercised its rights to patent nor indicated it has or it will do so. We still have the ability to sell our rights to develop technology and has successfully sold the rights in the past. Our rights to technology developed under contracts with private companies vary, depending upon negotiated terms.

Our internally funded research and development expenditures were \$1.1 million and \$803 thousand for the years ended December 31, 2009 and 2008, respectively.

#### Customers and Markets

Revenues from the delivery of a solar equipment cell line and a solar equipment module line to two different customers (Hanwha International LLC and Martifer Solar S.A.) accounted for 17% and 15%, respectively, of total net sales and revenue for 2009 and recurring revenue from the sale of solar cell materials to Federal Prison Industries, Inc accounted for 18% of total net sales and revenue during the same period. See "UNICOR Relationship" below. We did not have any customers that accounted for more than 10% of consolidated net sales and revenues in 2008.

Our export sales, which amounted to 59% and 57% of net sales and revenues for 2009 and 2008, respectively, continue to constitute a significant portion of our net sales and revenues. Over 90% of export sales in 2009 and 2008 were to solar equipment customers with the remainder to biomedical and optoelectronic related customers.

The following table shows net sales and revenues by geographic area (based on customer location) for the years ended December 31:

| (in thousands)    | 2009      | %   | 2008      | %   |
|-------------------|-----------|-----|-----------|-----|
| United States     | \$ 28,798 | 41  | \$ 27,804 | 43  |
| Europe/N. Africa  | 15,191    | 22  | 14,089    | 22  |
| Asia              | 25,561    | 37  | 22,782    | 35  |
| Rest of the world | 321       | —   | 289       | —   |
|                   | \$ 69,871 | 100 | \$ 64,964 | 100 |

#### UNICOR Relationship

On November 28, 2008, we entered into a Solicitation/Contract/Order For Commercial Items (the "Cell Materials Contract") to provide Federal Prison Industries, Inc., otherwise known as UNICOR ("UNICOR"), a twenty two month supply of multicrystalline solar cells for \$53.9 million in the aggregate. Delivery commenced in the first quarter of 2009 with approximately 23% of the contract value delivered in 2009 and 77% to be delivered in 2010. The contract allows UNICOR to exercise, at its option, three separate one-year extensions. The three, one year extensions have a target value of \$266.6 million in the aggregate. Under the terms of the Cell Materials Contract, UNICOR can terminate the contract for convenience at any time.

Over the past year, the parties have amended the pricing and quantity to be delivered during the initial two year term three times, but the overall value of the contract has remained unchanged. The last amendment adjusted the 2010 monthly delivery whereby approximately 15% of the contract value is expected to be delivered in the first six calendar months of 2010 with the remaining 62% of the contract value expected to be delivered in the last six months of 2010.

Additionally, in the third quarter of 2009, under a separate contract, we were awarded a contract to deliver a 50 MW module production line for another Federal prison facility located in Oregon. We expect to commence delivery of equipment for this line in first quarter of 2010 and complete installation in the second quarter of 2010. This line, along with our previously installed 25 MW module line in New York, will utilize solar cells from several vendors including us to fabricate modules for use in PV systems designated for Federal installations. Our systems group has established a teaming relationship with UNICOR whereby we could utilize UNICOR as a source of modules for Federal system projects. It has recently completed its registration process to allow it to bid for Federal PV system projects.



## Environmental Quality

Compliance with federal, state and local provisions regulating the discharge of materials into the environment has not materially affected our capital expenditures, earnings or its competitive position. Currently there are no lawsuits related to the environment or material administrative proceedings pending against us.

## Employees

At December 31, 2009, we had approximately 211 employees, of whom 200 worked full time. Our year end head count included 125 employees in manufacturing operations, 5 employees in research and development, and 81 employees in sales, general and administrative. We also employ part-time employees and hire independent contractors. Our employees are not represented by any collective bargaining agreement, and we have never experienced a work stoppage. We believe that our employee relations are good.

## Item 1A. Risk Factors

In addition to the other information in this Form 10-K, the following risk factors inherent in and affecting our business should be considered. The descriptions in this Form 10-K contain forward-looking statements that involve risks and uncertainties. Our actual results and the timing of certain events may differ materially from the results and timing described in the forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those described below and in “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and above in “Business.”

### Risks Relating to Our Business

Our success will depend upon our ability to effectively implement our business model of creating or acquiring scientifically advanced technology, developing and manufacturing commercially viable products from such technology and successfully marketing and distributing such products. The failure to successfully execute any stage of this process could have a materially negative impact on our business and results of operations.

We believe that our continued success will depend upon our ability to create or acquire scientifically advanced technology, apply our technology cost-effectively across product lines and markets, develop or acquire proprietary products, attract and retain skilled development personnel, obtain patent or other protection for our products, obtain required regulatory approvals, manufacture and successfully market our products either directly or through outside distributors and sales representatives and supply sufficient inventory to meet customer demand. There can be no assurance that we will realize financial benefit from our technology development and application efforts, that we will continue to be successful in identifying, developing and marketing new products or enhancing our existing products, or that products or technologies developed by others will not render our products or technologies non-competitive or obsolete.

We have experienced losses from operations, before the gain on sale of assets and gain on termination of contract, and we expect that our operating results will fluctuate in the future.

We have experienced losses from operations before non-recurring gains in fiscal year 2009. These losses have contributed to an accumulated deficit of approximately \$12.2 million as of December 31, 2009. Our revenues have not been sufficient to cover our operating expenses, and we anticipate that we may sustain future losses from operations if revenues do not increase. Future fluctuations in operating results may also be caused by a number of factors, many of which are outside our control. Additional factors that could affect our future operating results include the following:

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- Availability of raw materials processed by the capital equipment we provide to our buyers, particularly the polysilicon used in the manufacture of the silicon wafers and solar cells;
- Delays, postponements or cancellations of orders and shipments of our products, particularly in our solar equipment and solar systems businesses where individual order sizes may be large and thus may represent a significant portion of annual revenue;

- Changes in our receipt of license fees, milestone payments and royalty payments relating to our intellectual property;
- Loss of major customers, particularly as a result of customers changing their own product designs in such ways as reduce or eliminate the need for the manufacturing services we provide;
  - Reductions in the selling prices of our products and services as a result of competitive pressures;
- Certain customers purchasing our solar equipment and optoelectronic services need to raise capital or borrow money as they are not currently profitable. If capital and credit markets do not recover this may impact our ability to grow revenues;
  - Increased competition from current and future competitors, including competition resulting from services and products utilizing competing technologies;
  - Termination of existing grants with government agencies or delays in funding of grants awarded;
- Problems experienced by our solar representatives through which we market, sell, and service certain foreign markets, and
- We have had customers cancel contracts and forfeit their deposits. This may occur in the future and these deposits may not offset costs incurred until the inventory can be redeployed to other customers.

If we are unable to reach and sustain profitability from our operations, we risk depleting our working capital balances and our business may not continue as a going concern. Even if we are profitable, we may require additional working capital to meet expected growth. Although future sales of assets or technology licenses may be pursued, such sales cannot be assured. In addition, we may need to raise additional capital, or arrange other sources of funds, in order to sustain our operations. There can be no assurance that we will be able to raise such funds if they are required. Even if new financing were available, it may not be on commercially reasonable terms or terms that are acceptable to us.

Should photovoltaic technology be deemed unsuitable for global adoption coupled with a potential lack of sufficient demand for solar modules or photovoltaic manufacturing equipment, we may experience an adverse effect on our revenues and related profits.

Our ability to expand revenues and reach and sustain profitability is dependant, in large part, on the feasibility of widespread adoption of photovoltaic technology and world demand for solar modules and photovoltaic manufacturing equipment. Factors associated with the feasibility of widespread adoption of photovoltaic technology and world demand for solar modules and photovoltaic manufacturing equipment, the lack of which would limit the potential customers or expansion of our existing customer base, include, but are not limited to, the following:

- Consolidation of equipment manufacturers in the marketplace thereby reducing competitive advantages while experiencing market pricing concessions;
  - Global nature of the competitive landscape and challenges associated with geographic diversity;
- Performance and reliability of PV systems and thin film technology compared to conventional and other non-solar renewable energy sources and products;
- Availability and substance of government subsidies, incentives and renewable portfolio standards to support the development of the solar energy industry;
- Position in the marketplace relative to competition and ability to scale upward as business opportunities are identified; and
- Unforeseen fluctuations in financially viable markets that affect the ability of customers to secure required financing for capital expenditures at competitive rates as well as vendor credit constraints and interruptions in materials flow throughout the U.S. supply chain.

Our optoelectronics subsidiary, Spire Semiconductor, has had difficulty in sustaining its revenue growth. It has high fixed costs with relatively low variable costs. If it cannot increase its volume, it may never reach profitability.

–The growth of our optoelectronics business depends upon growth in demand for compound semiconductor wafers from manufacturers of microwave and optoelectronic circuits and sensors that, in turn, are used in diverse biomedical, telecommunications and aerospace products. Should these end-use markets not experience anticipated levels of growth and, in the case of telecommunications uses, experience a recovery from currently depressed business levels, our optoelectronics business could be adversely affected.

–A significant amount of revenue in 2009 was from a Federal government contract to develop solar concentrator cell technology. This contract will end in 2010. If we cannot commercialize this technology, we will need to find replacement customers for our services.

Our biomedical processing services are sold to OEM medical device manufacturers, primarily makers of orthopedic implants. Our ability to expand revenue and reach and sustain profitability depends substantially on the stability and growth of product lines that have incorporated our services into their product offering.

Demand for our customer products may be impacted by current efforts to reform the healthcare system in the United States which may adversely affect the demand for our services or impose direct or indirect additional costs. We may be limited in our ability to raise prices and pass additional costs to our customers. Our customers or their competitors may introduce new products that compete with existing product lines. If customers fail to adopt our services in these newer generation of products this may impair our ability to expand and maintain our revenue and reach and sustain profitability. Our ability to introduce new services is dependent upon medical device manufacturers adopting our technology and the devices being approved by appropriate governmental regulatory authorities, factors over which we have limited control.

The growth of our solar systems business depends on the success of the project development or construction activities associated with a particular contract and the associated risk that projects under development may not receive the required permits or unforeseen delays in the scheduling of construction. Either event may lead to cost overruns and margin erosion.

The costs of development and construction of solar powered facilities involves a number of risks. Potential upfront out-of-pocket costs may be incurred for preliminary engineering, design work permitting, professional fees, and other expenses before we can determine whether a project is economically feasible. Several factors in developing the success of a particular project include:

- Negotiation and execution of acceptable engineering, procurement and construction agreements;

- Obtaining required governmental permits and approvals, including, but not limited to, the right to interconnect to the electric grid;

- Timely payment of customer deposits to ensure a positive cash flow by deliverable;

- Facilitating the obtaining of the required construction financing; and

- On schedule implementation and satisfactory sign-off related to completion of construction.

We may enter into fixed price EPC (engineering, procurement and construction) contracts whereby we act as the project manager for our customers as it relates to the installation of the solar power systems. Major identified costs are estimated at the time of execution of the EPC contract and are the basis for the pricing model to our customers. As these cost estimates are preliminary in nature they may or may not be covered by contracts between us or the subcontractors, suppliers and other parties to the project. Additionally, we require qualified, licensed subcontractors to install our systems and shortages in the labor pool could significantly delay a project or otherwise increase our costs. Should project overruns occur and we are unable to pass these along to our customer, we may not achieve our projected margins.

While we have exited the medical products business with the sale of our medical product line to Bard Access Systems, we still are subject to certain risks related to past operations and our obligations to Bard. Certain assets related to our medical product line will be transferred to Bard only upon the completion of a product recall related to such assets,

which is expected to occur in the second quarter of 2010. Until these Contingent Deferred Assets are transferred by us, we will continue to manufacture and supply to Bard certain hemodialysis catheter products under the terms of a distribution agreement.

Bard's obligation to pay us \$3.0 million of deferred purchase price is dependant upon completing certain milestones. Upon the transfer of the Contingent Deferred Assets to Bard, Bard will pay to us \$1.5 million. Bard will pay up to \$1.5 million of the remaining deferred purchase price to us based upon the achievement of milestones related to the manufacture and supply of certain quantities of hemodialysis catheter products under the distribution agreement. The transfer price for hemodialysis catheter products delivered to Bard under the distribution agreement will be equal to our standard costs of goods, including related overhead, without mark-up and calculated in accordance with U.S. generally accepted accounting principles.

This arrangement exposes us to certain risks, including the following:

- If we do not close out the recall or new quality issues occur we have an obligation to continue to manufacture catheter products for Bard and will be the manufacture of record during this period. The transfer price for products supplied to Bard will cover our standard costs but not include any mark up in price.
- We depend on third-party subcontractors in the U.S. for the manufacturing, assembly and packaging of our biomedical products. Any difficulty in obtaining parts or services from these subcontractors could affect our ability to meet scheduled product deliveries and receive a milestone payment from the sale to Bard. Several additional significant risks associated with reliance on third-party subcontractors, include:
  - The lack of assured product supply and the potential for product shortages;
  - Reduced control over inventory located at contractors' premises;
  - Limited control over delivery schedules, manufacturing yields and production costs;
  - Direct control over product quality;
- The temporary or permanent unavailability of, or delays in obtaining, access to key process technologies; and
  - Dependence on single source contractors to provide critical services

We initiated a voluntary recall of certain catheters based upon three field complaints of catheter malfunctions received in the third quarter of 2009. No patient injury or complications resulted from the malfunction. It was determined that under certain molding conditions, there was a possibility that insufficient bonding may occur which could cause the catheter to malfunction. As it could not be isolated to a particular lot, we initiated a voluntary recall of any inventory held by our distributors and their customers. As the manufacturer of record we are responsible for ensuring that the product meets the product specifications and the associated product liability that may result in failure those specifications. Under the sale agreement with Bard for the sale of the Medical Products Business Unit, we will still be responsible for those devices taht we manufactured and will still be liable for any recalls of any of these devices in the future.

Although the disruptions in the capital and credit markets related to the recent national and world-wide financial crisis appear to be improving, any re-occurrence could adversely affect our results of operations, cash flows and financial condition, or those of our customers or suppliers.

The recent disruptions in the capital and credit markets or the re-occurrence of those disruptions could adversely impact our results of operations, cash flows and financial condition, or those of our customers and suppliers. Such disruptions could adversely affect our ability to draw on our bank credit facilities. Disruptions in the capital and credit markets as a result of uncertainty, changing or increased regulation, reduced alternatives or failures of significant financial institutions could adversely affect our access to liquidity needed to conduct or expand our businesses or conduct acquisitions or make other discretionary investments, as well as our ability to effectively hedge our currency or interest rates. These same conditions and disruptions may also adversely impact the capital needs of our customers and suppliers, which, in turn, could adversely affect our results of operations, cash flows and financial condition. These may include project delays as well as longer project cycles from start to finish.

Our business relies in part on a limited number of customers, and unfavorable developments in relation to any major customer may adversely affect our revenues, operating results and cash flows.

Revenues from the customer acceptance of a solar equipment cell line and a solar equipment module line to two different customers accounted for 17% and 15%, respectively, of total net sales and revenues for the year ended December 31, 2009. Follow on orders from these customers would be subject to a competitive bid process.

Revenue recognition of turnkey module and cell lines may result in significant fluctuations in operating results in sequential reporting periods and year over year comparisons. We did not have any customers that accounted for more than 10% of consolidated net sales and revenues in for the year ended December 31, 2008. Follow on orders from these large customers may be subject to a competitive bid process. While many of these sales of solar equipment are non-recurring, we



have had instances of recurring sales to such customers and may have them in the future. If an unfavorable development were to occur with respect to any significant customer it would likely have a material adverse affect on our business, financial condition, operating results, cash flows and future prospects.

Our solar business relies in part on our arrangements with UNICOR, and unfavorable developments in relation to this customer may adversely affect our revenues, operating results and cash flows going forward.

We have signed a contract to deliver approximately \$53.9 million in solar cells to UNICOR over a twenty-two month contract with twelve months remaining (\$12.3 million of revenue was recognized in 2009). We have arranged a purchase agreement with a third party vendor to supply cells for the UNICOR contract. If our vendor fails to produce to specifications or quantities, we may need to replace this vendor and there can be no assurance that such a replacement contract will be on similar or favorable pricing terms. UNICOR has required modifications to the contract over purchase price and quantity purchased (but not the overall contract value). We are in the second year of a two year contract. While UNICOR has the right to exercise a three one year extensions to purchase additional solar cells, there is no guarantee that they will exercise these options unless we can offer market competitive pricing. We have an additional contract to provide a turnkey line at a second Federal prison facility. If UNICOR is not successful in the production of PV modules, this may adversely impact our equipment business unless we are able to develop new customers to replace UNICOR.

We sell our products and services against established competitors, and entities now operating in related markets may enter our markets. Some of our current and potential competitors have greater financial and technical resources than we do. Should we be unable to offer our customers products and services that represent attractive price versus value, our business would suffer.

Although we believe that there are considerable barriers to entry into the markets we serve, including a significant investment in specialized capital equipment, product design and development, and the need for a staff with sophisticated scientific and technological knowledge, there can be no assurance that new or existing entities would not seek to enter our markets or that we would be able to compete effectively against such entities.

In our optoelectronics business, our manufacturing services may compete against the internal manufacturing capabilities of our customers. Although we believe that we offer significant advantages in terms of timely response, reduced total cost and reduced capital investment over the captive fabrication facilities of our customers, customers may elect to maintain their internal capabilities despite economic incentives to outsource these services from us.

The photovoltaic market is maturing due to the rapid growth of the industry. Our future success depends on our ability to sustain our business model.

We currently develop, manufacture and market customized turnkey solutions for the solar industry, including individual pieces of manufacturing equipment and full turnkey lines for cell and module production and testing. As the photovoltaic market matures, there may be fewer opportunities for start up firms. Further, customer purchasing decisions such as when purchasing decisions are made or how managed, what types of services are combined with purchased equipment may evolve as the industry expands. For example, we may determine that it is in our best interest to alter our strategy to focus on individual pieces of manufacturing equipment (as opposed to turn key solutions). We may have to offer vendor financing programs. Potentially re-engineering our focus toward individual pieces of manufacturing equipment and away from turnkey solutions may result in identification of non-productive assets, associated write-downs and/or reserves along with excess capacity and infrastructure costs.

If we are unable to develop and introduce new products successfully or to achieve market acceptance of our new products, our operating results would be adversely affected.

We compete in markets characterized by technological advances and improvements in manufacturing efficiencies. Our ability to operate profitably depends in large part on our timely access to, or development of, technological advances, and on our ability to use those advances to improve existing products, develop new products and manufacture those products efficiently. There can be no assurance that we will realize financial benefit from our development programs, will continue to be successful in identifying, developing and marketing new products or enhancing our existing products, or that products or technologies developed by others will not render our products or technologies non-competitive or obsolete. The failure to introduce new or enhanced products on a timely and cost competitive basis, or to attain market acceptance for commercial products, could have a material adverse effect on our business, results of operations or financial condition.

If we are not successful in protecting our intellectual property rights, our ability to compete may be harmed.

We rely on a combination of patent, copyright, trademark and trade secret protections as well as confidentiality agreements and other methods, to protect our proprietary technologies and processes. For example, we enter into confidentiality agreements with our employees, consultants and business partners, and control access to and distribution of our proprietary information. We have been issued 27 United States patents, two foreign patents and have a number of pending patent applications. However, despite our efforts to protect our intellectual property, we cannot assure that:

- The steps we take to prevent misappropriation or infringement of our intellectual property will be successful;
  - Any existing or future patents will not be challenged, invalidated or circumvented;
  - Any pending patent applications or future applications will be approved;
- Others will not independently develop similar products or processes to ours or design around our patents; or
  - Any of the measures described above would provide meaningful protection.

A failure by us to meaningfully protect our intellectual property could have a material adverse effect on our business, financial condition, operating results and ability to compete. In addition, effective patent, copyright, trademark and trade secret protection may be unavailable or limited in certain countries.

From time to time we may be subject to lawsuits by other parties seeking to enforce their intellectual property rights. Any litigation could result in the expenditure of significant financial resources and the diversion of management's time and resources. In addition, litigation in which we are accused of infringement may have an impact on prospective customers, cause product delays, require us to develop non-infringing technology, make substantial payments to third parties or enter into royalty or license agreements, which may not be available on acceptable terms, or at all. If a successful claim of infringement were made against us and we could not develop non-infringing technology or license the infringed or similar technology on a timely and cost-effective basis, we may be forced to stop selling current products or abandon new products under development and we could be exposed to legal actions by our customers.

We depend on others, particularly on agencies of the United States government, for funding our research and development effort.

Most of our research and development work is funded by agencies of the United States government either directly or via their contractors. Loss of outside funding may materially adversely affect our ability to further develop our proprietary technologies and to apply these technologies to our current products and products under development. If we are unable to maintain our current level of such funding for any reason, we would need to generate funds for such research from other sources, reduce our research and development effort or increase our internal funding for research and development. An increase in internally funded research and development would have a negative impact on our profitability.

Additionally, the process of bidding for, obtaining, retaining and performing United States government contracts is subject to a large number of United States government regulations and oversight requirements. Compliance with these government regulations requires extensive record keeping and the maintenance of complex policies and procedures relating to all aspects of our business, as well as to work performed for us by any subcontractors. Any failure to comply with applicable regulations, or to require our subcontractors so to comply, could result in a variety of adverse consequences, ranging from remedial requirements to termination of contracts, reimbursement of fees, reduction of fees on a going forward basis and prohibition from obtaining future United States government contracts. While we believe that we have in place systems and personnel to ensure compliance with all United States government regulations relating to contracting, we cannot assure that we will at all times be in compliance or that any failure to comply will not have a material adverse effect on our business, results of operations or financial condition.

The U.S. government has certain rights relating to our intellectual property.

The United States government retains the right to obtain a patent on any invention developed under government contracts as to which we do not seek and obtain a patent, and may require us to grant a third party license of such invention if steps to achieving practical application of the invention have not been taken. The United States government also retains a non-exclusive, royalty-free, non-transferable license to all technology developed under government contracts, whether or not patented, for government use, including use by other parties to United States government contracts. Furthermore, our United

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States government contracts prohibit us from granting exclusive rights to use or sell any inventions unless the grantee agrees that any product using the invention will be manufactured substantially in the United States.

Our success depends on our ability to hire and retain qualified technical personnel, and if we are unable to do so, our product development efforts and customer relations will suffer.

Our products require sophisticated manufacturing, research and development, marketing and sales, and technical support. Our success depends on our ability to attract, train and retain qualified technical personnel in each of these areas. Competition for personnel in all of these areas is intense and we may not be able to hire or retain sufficient personnel to achieve our goals or support the anticipated growth in our business. The market for the highly trained personnel we require is very competitive, due to the limited number of people available with the necessary technical skills and understanding of our products and technology. If we fail to hire and retain qualified personnel, our product development efforts and customer relations will suffer.

We are subject to environmental laws and other legal requirements that have the potential to subject us to substantial liability and increase our costs of doing business.

Our properties and business operations are subject to a wide variety of federal, state, and local environmental, health and safety laws and other legal requirements, including those relating to the storage, use, discharge and disposal of toxic, volatile or otherwise hazardous substances used in our manufacturing processes. We cannot assure that these legal requirements will not impose on us the need for additional capital expenditures or other requirements. If we fail to obtain required permits or otherwise fail to operate within these or future legal requirements, we may be required to pay substantial penalties, suspend our operations or make costly changes to our manufacturing processes or facilities. Although we believe that we are in compliance and have complied with all applicable legal requirements, we may also be required to incur additional costs to comply with current or future legal requirements.

Our international sales subject us to risks that could adversely affect our revenue and operating results.

Sales to customers located outside the U.S. have historically accounted for a significant percentage of our revenue (approximately 59% in 2009) and we anticipate that such sales will continue to be a significant percentage of our revenue. International sales involve a variety of risks and uncertainties, including risks related to:

- Reliance on strategic alliance partners such as representatives and licensees;
- Compliance with changing foreign regulatory requirements and tax laws;
- Reduced protection for intellectual property rights in some countries;
- Longer payment cycles to collect accounts receivable in some countries;
- Increased costs or reduced revenues as a result of movements in foreign currency exchange rates;
- Political instability;
- Economic downturns in international markets; and
- Changing restrictions imposed by United States export laws.

Failure to successfully address these risks and uncertainties could adversely affect our international sales, which could in turn have a material and adverse effect on our results of operations and financial condition.

The use of our catheter and other medical related products entails a risk of physical injury; the defense of claims arising from such risk may exceed our insurance coverage and distract our management.

The use of orthopedic and other medical devices may entail a risk of physical injury to patients. To the extent we fail to meet the manufacturers' specifications in performing our biomedical processing services, we may be exposed to potential product liability and other damage claims. We have had cases brought against us as a supplier of services

with other defendants over the alleged manufacture and sale of defective heart valves. In the past, we have settled a case alleging that our catheter contributed to a patient's death in Ohio. Further, we are currently conducting a voluntary recall of certain hemodialysis catheters as the manufacturer of record due to a vendor molding issue. While no claims of product liability or other damages have been initiated against us due to the recall, this does not preclude such an event occurring as we have only recalled unused inventory held by distributors and hospitals. Even after the sale of our catheter product line to Bard we will still be the manufacturer of record of catheters implanted in patients. Furthermore, the use of our photovoltaic module manufacturing equipment could result in operator injury. We maintain product liability and umbrella insurance coverage;

however, there can be no assurance that any product liability claim assessed against us would not exceed our insurance coverage, or that insurance coverage would continue to be available. While we typically obtain agreements of indemnity from manufacturers of biomedical products for which we provide manufacturing services, there can be no assurance that any such indemnity agreements will be enforceable or that such manufacturers will have adequate funds to meet their obligations under such agreements. The cost of defending a product liability, negligence or other action, and/or assessment of damages in excess of insurance coverage, could have a material adverse effect on our business, results of operations, or financial condition.

### Risks Related to Our Company

We may not be able to maintain our listing on the Nasdaq Global Market, which would adversely affect the price and liquidity of our common stock.

Our stock is currently listed on the Nasdaq Global Market. In order to maintain our listing on the Nasdaq Global Market, we must satisfy Nasdaq continued listing requirements. Under Nasdaq rules, we will maintain our listing so long as we meet, among other requirements, one of the following three requirements:

- stockholders' equity of at least \$10 million and market value of the common stock held by non-affiliates of at least \$5 million (Marketplace Rule 5450(b)(1));
- market value of listed securities of at least \$50 million and market value of the common stock held by non-affiliates of at least \$15 million (Marketplace Rule 5450(b)(2)); or
- total assets and total revenue of at least \$50 million each for the most recently completed fiscal year or two of the three most recently completed fiscal years and market value of the common stock held by non-affiliates of at least \$15 million (Marketplace Rule 5450(b)(3)).

As of the filing date of this Annual Report on Form 10-K, we are meeting only Marketplace Rule 5450(b)(3), as we have total assets and total revenue of at least \$50 million each for the most recently completed fiscal year and the market value of the common stock held by non-affiliates is greater than \$15 million (approximately \$21.9 million as of March 26, 2010).

There is no assurance that in the future we will continue to satisfy Nasdaq continued listing requirements. At various times in the past, we have received deficiency notices from Nasdaq and have been able to regain compliance prior to delisting, but we cannot assure you that we will always be able to regain or maintain compliance with Nasdaq continued listing requirements.

If we fail to maintain compliance with these rules and our common stock is delisted from the Nasdaq Global Market, there could be a number of negative implications, including reduced liquidity in the common stock as a result of the loss of market efficiencies associated with the Nasdaq Global Market, the loss of federal preemption of state securities laws, the potential loss of confidence by suppliers, customers and employees, as well as the loss of analyst coverage and institutional investor interest, fewer business development opportunities and greater difficulty in obtaining financing.

Our Company is subject to control by principal stockholder.

Roger G. Little, our founder, Chairman of the Board, Chief Executive Officer and President, controls approximately 26% of our outstanding common stock. As a result, Mr. Little is in a position to exert significant influence over actions which require stockholder approval and generally to direct our affairs, including the election of directors,

potential acquisitions and sales or otherwise preventing or delaying changes in control of our Company that may be otherwise viewed as beneficial by shareholders other than Mr. Little.

We do not pay dividends and we may not pay dividends in the future.

We have paid no cash dividends since our inception. We anticipate retaining any future earnings for reinvestment in operations and do not anticipate that dividends will be paid in the foreseeable future. Accordingly, the return on investment should be expected to depend on changes in the market price of our common stock.



The market price for our common stock has been volatile and future volatility could cause the value of investments in our Company to fluctuate.

Our stock price has experienced significant volatility. While our revenues have increased, we expect that uncertainty regarding demand for our products will cause our stock price to continue to be volatile. In addition, the value of your investment could decline due to the impact of any of the following factors, among others, upon the market price of our common stock:

- Overall economic conditions and general market volatility;
- Changes in investment analysts' estimates of our revenues and operating results;
  - Our failure to meet investment analysts' performance expectations; and
- Changes in market valuations of other companies in the alternative energy, semiconductor or biomedical industries.

In addition, many of the risks described elsewhere in this section could materially and adversely affect our stock price, as discussed in those risk factors. U.S. financial markets have recently experienced substantial price and volume volatility. Fluctuations such as these have affected and are likely to continue to affect the market price of our common stock.

Some of the requirements of Sarbanes-Oxley affect us as a small company disproportionately, and we may not be able to comply in a timely manner despite substantial effort and expense.

The Sarbanes-Oxley Act of 2002 imposed many new requirements on public companies, the most significant of which involves the documentation, testing and reporting of the effectiveness of our internal control over financial reporting.

We are required to report on our assessment of the effectiveness of our internal control over financial reporting in this Annual Report on Form 10-K. We have documented and tested our internal controls in 2009 and this effort involved substantial time and expense. We have identified material weaknesses, as discussed below, from our internal assessment and our independent registered public accounting firm has also identified items in connection with its annual audit of our consolidated financial statements.

Based on this evaluation, management concluded that the following material weaknesses in internal control over financial reporting existed as of December 31, 2009 and 2008: we did not have adequate staffing with the necessary knowledge, experience and training to ensure the completeness and accuracy of our financial statements. Additionally, our internal policies and procedures related to internal control over financial reporting were not effective. As a result of these material weaknesses, issues related to accounting for inventory, accruals, reserves, income taxes and revenues existed in our internal preliminary 2008 fiscal year consolidated financial statements and resulted in a restatement of 2007 and 2008 results. For more detailed information see "Item 9A(T). Controls and Procedures."

We are working to address the issues raised by this material weakness, but we may not be successful in remediating them in a timely manner.

Our credit agreements with Silicon Valley Bank subjects us to various restrictions, which may limit our ability to pursue business opportunities.

Our credit agreements with Silicon Valley Bank subjects us to various restrictions on our ability to engage in certain activities without the prior written consent of the bank, including, among other things, our ability to:

- Dispose of or encumber assets, other than in the ordinary course of business,
  - Incur additional indebtedness,
- Merge or consolidate with other entities, or acquire other businesses, and

-Make investments.

The agreements also subject us to various financial and other covenants with which we must comply on an ongoing or periodic basis. For example under our equipment and revolving line of credit, as long as any commitment remains outstanding under the facility, we must comply with a financial covenant, whereby we must maintain a minimum cash balance and availability line of credit. If we violate these or any other covenant, any outstanding debt under these agreements could become immediately due and payable, the bank could proceed against any collateral securing indebtedness and our

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ability to borrow funds in the future may be restricted or eliminated. These restrictions may also limit our ability to pursue business opportunities or strategies that we would otherwise consider to be in the best interests of the company.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Our corporate headquarters are located at One Patriots Park, Bedford, Massachusetts. This 144,230 square foot facility is leased and contains our administrative offices, sales and marketing offices, research and development facilities and the manufacturing facilities of our biomedical and solar equipment and systems businesses. The Related Party lease expires in November 2012. We lease an approximately 90,000 square foot facility located at 25 Sagamore Park Road, Hudson, New Hampshire that contains a semiconductor wafer growth and fabrication facility and administrative offices used primarily by our optoelectronics business unit including Spire Semiconductor. The lease expires in August 2015. We believe that our facilities are suitable for their present intended purposes and adequate for our current level of operations.

Item 3. Legal Proceedings

From time to time, we are subject to legal proceedings and claims arising from the conduct of our business operations.

We are not aware of any current or pending legal proceedings to which we are or may be party that we believe could materially adversely affect our results of operations or financial condition or cash flows.

Item 4. Reserved

PART II

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

Market Information

Our common stock is traded on the Nasdaq Global Market under the symbol "SPIR." The following chart sets forth the high and low bid prices for the common stock for the periods shown:

|                | High Bid | Low Bid  |
|----------------|----------|----------|
| 2009           |          |          |
| First Quarter  | \$ 7.60  | \$ 3.25  |
| Second Quarter | 8.99     | 4.00     |
| Third Quarter  | 6.57     | 3.50     |
| Fourth Quarter | 6.17     | 3.50     |
| 2008           |          |          |
| First Quarter  | \$ 25.82 | \$ 10.32 |
| Second Quarter | 18.63    | 9.71     |
| Third Quarter  | 14.48    | 8.71     |
| Fourth Quarter | 15.63    | 2.79     |

These prices do not reflect retail mark-ups, markdowns or commissions and may not reflect actual transactions. The closing price of the common stock on March 26, 2010 was \$4.20, and on that date, there were 164 stockholders of record. The number of holders does not include individuals or entities who beneficially own shares but whose shares are held of record by a broker or clearing agency, but does include each such broker or clearing agency as one record holder.

## Dividends

We did not pay any cash dividends during 2009 or 2008 and currently do not intend to pay dividends in the foreseeable future so that we may reinvest our earnings in the development of our business. The payment of dividends in the future will be at the discretion of the Board of Directors. In addition, under our credit agreements with Silicon Valley Bank, we may not pay dividends on our common stock without the consent of the bank.

## Item 6. Selected Financial Data

Not required as we are a smaller reporting company.

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

This Management's Discussion and Analysis of Financial Condition and Results of Operations section and other parts of this Report contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), which statements involve risks and uncertainties. These statements relate to our future plans, objectives, expectations and intentions. These statements may be identified by the use of words such as "may", "could", "would", "should", "will", "expects", "anticipates", "intends", "plans", "believes", "estimates", and similar expressions. Our actual results and the timing of certain events may differ significantly from the results and timing described in the forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those factors described below and above under "Item 1A. Risk Factors" and "Item 1. Business." Readers are encouraged to carefully review those risk factors. The following discussion and analysis of our financial condition and results of operations should be read in light of those factors and in conjunction with our accompanying Consolidated Financial Statements, including the Notes thereto.

## Overview

We develop, manufacture and market highly-engineered products and services in three principal business areas: (i) capital equipment for the PV solar industry, (ii) biomedical and (iii) optoelectronics, generally bringing to bear expertise in materials technologies, surface science and thin films across all three business areas, discussed below.

In the PV solar area, we develop, manufacture and market specialized equipment for the production of terrestrial photovoltaic modules from solar cells, provide photovoltaic systems for application to powering buildings with connection to the utility grid and supplies photovoltaic materials. Our equipment has been installed in approximately 200 factories in 50 countries. The equipment market is very competitive with major competitors located in Japan and Germany. Our flagship product is our Sun Simulator which tests module performance. Our other product offerings include turnkey module lines and to a lesser extent other individual equipment. To compete we offer other services such as training and assistance with module certification. At times, we supply materials such as solar cells to certain customers. We also provide turnkey services to our customers to backward integrate to solar cell manufacturing.

During 2009, we dissolved our joint venture, Gloria Spire Solar. We received a return of capital, hired several key employees, received pending customer contracts and have restarted a photovoltaic systems business. Our photovoltaic systems business provides an application for powering buildings with connection to the utility grid. We do not manufacture modules, but rather procure them from multiple suppliers based upon our industry knowledge of the supply chain.

In the optoelectronics area, we provide custom compound semiconductor foundry and fabrication services on a merchant basis to customers involved in biomedical/biophotonic instruments, telecommunications and defense applications. Services include compound semiconductor wafer growth, other thin film processes and related device

processing and fabrication services. We also provide materials testing services and perform services in support of sponsored research into practical applications of optoelectronic technologies. We are developing solar concentrator cell technology to provide to high efficient cells to the industry.

In the biomedical area, we provides value-added surface treatments to manufacturers of orthopedic and other medical devices that enhance the durability, antimicrobial characteristics or other material characteristics of their products; and performs sponsored research programs into practical applications of advanced biomedical and biophotonic technologies.

Operating results will depend upon revenue growth and product mix, as well as the timing of shipments of higher priced products from our solar equipment line, delivery of solar systems and solar materials. Export sales, which amounted to 59% of net sales and revenues for 2009, continue to constitute a significant portion of our net sales and revenues.

## Results of Operations

The following discussions of our results of continuing operations exclude the results related to the Medical Products Business Unit, which was sold on December 14, 2009. The Medical Products Business Unit has been segregated from continuing operations and is reflected as discontinued operations for all periods presented. See “Income (loss) from Discontinued Operations” below and Note 17 to the consolidated financial statements.

The following table sets forth certain items as a percentage of net sales and revenues for the periods presented:

|  | Year Ended December 31, |    |      |   |
|--|-------------------------|----|------|---|
|  | 2009                    |    | 2008 |   |
| Net sales and revenues   | 100                     | %  | 100  | % |
| Cost of sales and revenues   | (91)                    | )  | (70) | ) |
| Gross margin   | 9                       |    | 30   |   |
| Selling, general and administrative expenses                                   | (25)                    | )  | (28) | ) |
| Internal research and development expenses                                     | (1)                     | )  | (1)  | ) |
| Gain on termination of contracts   | 4                       |    | 10   |   |
| Income (loss) from continuing operations                                       | (13)                    | )  | 11   |   |
| Other expense, net   | (2)                     | )  | (2)  | ) |
| Income (loss) from continuing operations before income tax benefit (provision) | (15)                    | )  | 9    |   |
| Income tax benefit (provision) - continuing operations                         | 3                       |    | (1)  | ) |
| Net income (loss) from continuing operations                                   | (12)                    | )  | 8    |   |
| Net income (loss) from discontinued operations, net of tax                     | 4                       |    | (1)  | ) |
| Net income (loss)  | (8)                     | )% | 7    | % |

## Overall

Our total net sales and revenues for the year ended December 31, 2009 (“2009”) increased 8% to \$69.9 million as compared to \$65.0 million for the year ended December 31, 2008 (“2008”). The increase came primarily from our solar business unit, while our biomedical business unit achieved a small increase partially offset by a decrease in our optoelectronics business unit.

## Solar Business Unit

Sales in our solar business unit increased 11% to \$57.8 million in 2009 as compared to \$51.9 million in 2008. The increase is the result of sales in solar cell materials during 2009, partially offset by a decrease in solar equipment sales. We did not sell solar cell materials in 2008.

## Biomedical Business Unit

Revenues of our biomedical business unit increased 15% to \$9.1 million in 2009 as compared to \$8.0 million in 2008. The increase reflects increased revenues from our orthopedics coatings services slightly offset by a decrease in revenue from research and development contracts.

## Optoelectronics Business Unit

Sales in our optoelectronics business unit decreased 43% in 2009 to \$2.9 million as compared to \$5.1 million in 2008. The decrease reflects an overall decrease in optoelectronics activities attributable to the recent global economic

recession and to a lesser extent the termination of a contract with Principia Lightworks, Inc. in March 2009, as discussed below in Gains on Termination of Contracts.

Year Ended December 31, 2009 Compared to Year Ended December 31, 2008

Net Sales and Revenues

The following table categorizes our net sales and revenues for the periods presented:

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| (in thousands)                                  | Year Ended December 31, |           | Increase/(Decrease) |       |
|---|-------------------------|-----------|---------------------|-------|
|   | 2009                    | 2008      | \$                  | %     |
| Sales of goods                                  | \$ 57,761               | \$ 50,336 | \$ 7,425            | 15%   |
| Contract research, service and license revenues | 12,110                  | 14,628    | (2,518 )            | (17)% |
| Net sales and revenues                          | \$ 69,871               | \$ 64,964 | \$ 4,907            | 8%    |

The 15% increase in sales of goods for 2009 as compared to 2008 was primarily due to new sales in solar cell materials, partially offset by decreased solar equipment revenues. New sales of solar cell materials, all to one customer, were \$12.4 million in 2009. Solar equipment sales decreased 10% in 2009 as compared to 2008 primarily due to an overall slowdown in solar power industry activity.

The 17% decrease in contract research, services and license revenues for 2009 as compared to 2008 is primarily attributable to a decrease in optoelectronics, royalties and research and development activities, partially offset by an increase in orthopedic services. Revenue from our optoelectronics processing services (Spire Semiconductor) decreased 43% in 2009 compared to 2008 as a result of an overall decrease in optoelectronics activities attributable to the recent global economic recession and to a lesser extent the termination of a contract with Principia Lightworks, Inc. in March 2009 (see Gains on Termination of Contracts). Revenue from royalties decreased 100% as a result of the termination of contract with Nisshinbo Industries, Inc. in November 2008. Revenues from our research and development activities decreased 3% in 2009 as compared to 2008 primarily due to an increase in the number and value of contracts associated with funded research and development. Revenues from our orthopedic activities increased 21% in 2009 as compared to 2008.

Revenues from the delivery of a solar equipment cell line and a solar equipment module line to two different customers accounted for 17% and 15%, respectively, of total net sales and revenue for 2009 and recurring revenue from the sale of solar cell materials to another customer accounted for 18% of total net sales and revenue during the same period. We did not have any customers that accounted for more than 10% of consolidated net sales and revenues in 2008.

#### Cost of Sales and Revenues

The following table categorizes our cost of sales and revenues for the periods presented, stated in dollars and as a percentage of related sales and revenues:

| (in thousands)                                  | Years Ended December 31, |     |           |     | Increase/(Decrease) |      |
|---|--------------------------|-----|-----------|-----|---------------------|------|
|   | 2009                     | %   | 2008      | %   | \$                  | %    |
| Cost of goods sold                              | \$ 54,246                | 94% | \$ 35,588 | 71% | \$ 18,658           | 52%  |
| Cost of contract research, service and licenses | 9,164                    | 76% | 10,003    | 68% | (839 )              | (8)% |
| Net cost of sales and revenues                  | \$ 63,410                | 91% | \$ 45,591 | 70% | \$ 17,819           | 39%  |

Cost of goods sold increased 52% for 2009 as compared to 2008, primarily as a result of costs related to a two year solar materials contract of \$10.9 million, costs related to the completion of an automated module line and cell line and

a provision for a reserve of \$2.0 million related to actual and estimated costs to complete two solar projects. As a percentage of sales, cost of goods sold was 94% of sales of goods in 2009 as compared to 71% of sales of goods in 2008. This increase in the percentage of sales in 2009 is due to the provision for a reserve of \$2.0 million related to actual and estimated costs to complete two solar projects, low margin related to the completion of an automated module line, low margin related to a solar cell materials contract and an unfavorable utilization of solar manufacturing overhead.

Cost of contract research, services and licenses decreased 8% for 2009 as compared to 2008, primarily as a result of decreased costs at our optoelectronics facility (Spire Semiconductor) due to lower associated revenues, partially offset by increased costs of our contract research activities due to higher volumes. Cost of contract research, services and licenses as a percentage of revenue increased to 76% of revenues in 2009 from 68% in 2008, primarily due to unfavorable margin related to our optoelectronics facility, partially offset by favorable margins in orthopedic services in 2009.

Cost of sales and revenues also includes approximately \$160 thousand and \$180 thousand of stock-based compensation in 2009 and 2008, respectively.

### Operating Expenses

The following table categorizes our operating expenses for the periods presented, stated in dollars and as a percentage of net sales and revenues:

| (in thousands)                      | Years Ended December 31, |     |           |     | Increase/(Decrease) |      |
|-------------------------------------|--------------------------|-----|-----------|-----|---------------------|------|
|                                     | 2009                     | %   | 2008      | %   | \$                  | %    |
| Selling, general and administrative | \$ 17,836                | 26% | \$ 18,157 | 28% | \$ (321 )           | (2)% |
| Internal research and development   | 1,088                    | 1%  | 803       | 1%  | 285                 | 35%  |
| Operating expenses                  | \$ 18,924                | 27% | \$ 18,960 | 29% | \$ (36 )            |      |

### Selling, General and Administrative Expenses

Selling, general and administrative expense decreased 2% in 2009 as compared to 2008, primarily due to lower sales commissions paid to agents and less marketing activities, partially offset by an increase in corporate staffing levels and related employee costs to support our overall growth. Selling, general and administrative expense as a percentage of revenue decreased to 26% of revenues in 2009 from 28% of revenues in 2008. Selling, general and administrative expense includes approximately \$425 thousand of stock-based compensation in 2009 versus \$574 thousand in 2008.

### Internal Research and Development Expenses

Internal research and development expense increased 35% in 2009 as compared to 2008, primarily as a result of higher levels of research and development spent in the solar group. As a percentage of sales and revenue, however, internal research and development expenses remained at 1% for both periods.

### Gains on Termination of Contracts

On September 1, 2008, Nisshinbo delivered a letter to us stating its intention to terminate the global Consortium Agreement (the "Consortium Agreement") entered into between Nisshinbo and us on May 16, 2005, relating to the development, manufacturing and sales of solar photovoltaic module manufacturing equipment. In accordance with the Consortium Agreement, Nisshinbo provided its 180 day prior notice to terminate the Consortium Agreement effective as of February 28, 2009. However, on November 28, 2008, we signed a Separation and Novation Agreement (the "Separation Agreement") with Nisshinbo that, among other things, accelerated the termination of the Consortium Agreement and the payment by Nisshinbo to us for an early termination penalty. Under the Separation Agreement, the termination of the Consortium Agreement was effective as of November 30, 2008.

Under the terms of the Consortium Agreement and the Separation Agreement, as a result of early termination by Nisshinbo for convenience, we received a termination penalty payment of \$6.8 million in December 2008. In addition, we received a final royalty payment of approximately \$659 thousand from Nisshinbo for outstanding equipment being built by Nisshinbo for its customer base. We granted Nisshinbo a perpetual, royalty-free, non-exclusive, non-sub-licensable (for four (4) years) license to our existing solar photovoltaic module manufacturing equipment methods of engineering, designing, manufacturing and other related methods that were in effect when we entered into the Consortium Agreement in 2005. Both parties declined technology licenses for technology developed by the other party during the term of the Consortium Agreement. Nisshinbo will continue to manufacture certain products for us

on a non-exclusive basis.

On August 29, 2008, we delivered to Principia Lightworks, Inc. (“Principia”) a Notice of Breach and Pending Termination of a certain Manufacturing Agreement, dated August 29, 2006, by and between Spire Semiconductor and Principia (the “Manufacturing Agreement”). Under the terms of the Manufacturing Agreement, Principia made an up-front payment for nonrecurring engineering and facility access costs and was required to make monthly facility availability payments throughout the term of the agreement. As a result of Principia’s failure to make monthly facility availability payments in 2008, we have fully reserved \$225 thousand against Principia’s accounts receivable balance. We entered into a mutual standstill agreement with Principia, which expired on March 15, 2009. The purpose of the standstill was to give the parties additional time to negotiate a resolution.

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On March 27, 2009, Spire Semiconductor and Principia mutually agreed to terminate the Manufacturing Agreement for convenience and entered into a separation and novation agreement (the "Novation Agreement"). Under the terms of the Novation Agreement, both parties agreed to terminate technology licenses that were granted to each other under the terms of the Manufacturing Agreement and Spire Semiconductor was released from its production requirements to Principia. Principia was released from paying its future facility availability payments due under the Manufacturing Agreement but will be required to pay facility availability payments of \$300 thousand. Spire Semiconductor holds 67,500 shares of Principia stock as collateral against the outstanding facility availability payments. During the three months ended March 31, 2009, we accelerated the amortization of deferred revenue and recognized \$1.54 million as a gain on termination of contracts related to the termination of the Manufacturing Agreement. See Note 15 to the consolidated financial statements.

On June 18, 2009, we entered into a settlement agreement with Marubeni Corporation with respect to the License to Manufacture and Distribute Equipment Agreement (the "License Agreement") dated April 1, 2003 for the license of manufacturing and distribution in Japan of our solar photovoltaic modular manufacturing equipment. Under the terms of the settlement agreement, both parties agreed to terminate the License Agreement including but not limited to the eighteen (18) month non-compete obligation. As a result of the settlement, we received a payment and recognized a gain on termination of contracts of \$200 thousand in the second quarter of 2009.

In the fourth quarter of 2009, we determined that three purchase and sale agreements with Jiangxi Gemei Sci-Tech., LLC ("Jiangxi") related to a module equipment line and cell equipment line were terminated. Jiangxi had failed to make payments as required by the agreements and has not responded to numerous communications by us. We made commitments to purchase equipment on behalf of Jiangxi and due to Jiangxi not making contractual payments, we entered into settlement agreements with these vendors. As a result of deposits paid by Jiangxi less settlements paid to vendors and inventory written off, we have recognized a gain on termination of contract of \$1.4 million.

#### Other Income (Expense), Net

We earned \$16 thousand and \$21 thousand of interest income in 2009 and 2008, respectively. The decrease in earned interest relates to the decrease in interest rates during 2009 compared with 2008. We incurred interest expense of \$300 thousand and \$233 thousand in 2009 and 2008, respectively. The slight increase in interest expense is due to higher interest payments associated with the amounts outstanding under the credit facilities with Silicon Valley Bank in 2009 compared with 2008.

We recorded losses of \$1,023 thousand and \$807 thousand on the equity investment in the joint venture with Gloria Solar in 2009 and 2008, respectively. Included in this loss for 2009 is an impairment charge of \$85 thousand to reduce the value of the investment to the estimated proceeds from the liquidation of the joint venture. See Note 16 to the consolidated financial statements.

We had currency exchange losses of approximately \$258 thousand and \$430 thousand in 2009 and 2008, respectively.

#### Income Taxes

We recorded a tax benefit on our loss from continuing operations of \$2,241 thousand which was offset by a provision on our income from discontinued operations of \$2,254 thousand. A full valuation allowance has been provided against the deferred tax assets due to uncertainty regarding the realization of the net operating loss in the future. A valuation allowance was provided against the deferred tax assets generated in 2008 as well due to uncertainty regarding the realization of the net operating loss in the future. At December 31, 2009, we had gross deferred tax assets of \$7.3 million, against which a valuation allowance of \$6.4 million had been applied. The remaining deferred tax assets have been offset against deferred tax liabilities.

Income (loss) from Discontinued Operations

During the second quarter of 2009, we began pursuing an exclusive sales process of our Medical Products Business Unit. On December 14, 2009, we completed the sale of the Medical Products Business Unit to Bard Access Systems, Inc. Accordingly, the results and assets of the Medical Products Business Unit are being presented herein as discontinued operations and assets held for sale.

We recorded net income from discontinued operations of \$3.4 million in 2009 and a loss from discontinued operations of \$680 thousand in 2008. Included in discontinued operations in 2009 is a gain on sale of business unit to Bard of \$7.7 million, an

income tax provision of \$2.3 million and reserves for inventory and potential returns related to a voluntary recall of medical products totaling approximately \$1.1 million for the year ended December 31, 2009. Not included in discontinued operations are certain indirect costs of the Medical Products Business Unit that have been reclassified to selling, general and administrative expense of \$584 thousand and \$541 thousand for the years ended December 31, 2009 and 2008, respectively. See Note 17 to the consolidated financial statements.

Included in the gain of \$7.7 million is proceeds received from Bard of \$9.4 million, less inventory transferred to Bard of \$610 thousand, less patents transferred to Bard of \$301 thousand and less legal, professional and other fees related to complete the sale of \$748 thousand.

#### Net Income (Loss)

We reported a net loss for the year ended December 31, 2009 of \$5.3 million and net income for the year ended December 31, 2008 of \$4.8 million. The net decrease in loss of approximately \$10.1 million is primarily due to a decrease in gross margin of \$12.9 million partially offset by one time net gains on termination of contracts and gains on sale of business unit included in discontinued operations.

#### Liquidity and Capital Resources

|                           | December<br>31,<br>2009 | December<br>31,<br>2008 | Increase (Decrease) |     |    |
|---------------------------|-------------------------|-------------------------|---------------------|-----|----|
| (in thousands)            |                         |                         | \$                  |     | %  |
| Cash and cash equivalents | \$ 8,999                | \$ 5,971                | \$ 3,028            | 51  | %  |
| Working capital           | \$ 3,718                | \$ 6,835                | \$ (3,117 )         | (46 | )% |

Cash and cash equivalents increased due to cash provided by investing activities, primarily due to a one time payment in 2009 of \$9.4 million related to the sale of the Medical Products Business Unit included in discontinued operations, partially offset by cash used in operating and financing activities. The overall decrease in working capital is due to a decrease in current assets, primarily deferred cost of goods sold, partially offset by an increase in inventory and a decrease in advances on contracts in progress. We have historically funded our operating cash requirements using operating cash flow, proceeds from the sale and licensing of technology and assets and proceeds from the sale of equity securities.

There are no material commitments by us for capital expenditures. At December 31, 2009, our accumulated deficit was approximately \$12.2 million compared to accumulated deficit of approximately \$6.9 million as of December 31, 2008.

We have numerous options on how to fund future operational losses or working capital needs, including but not limited to sales of equity, bank debt or the sale or license of assets and technology, as we have done in the past; however, there are no assurances that we will be able to sell equity, obtain or access bank debt, or sell or license assets or technology on a timely basis and at appropriate values. We have developed several plans including cost containment efforts and outside financing to offset a decline in business due to the recent global economic recession. As a result, we believe we have sufficient resources to finance our current operations through at least December 31, 2010.

#### Loan Agreements

On May 25, 2007, we entered into a Loan and Security Agreement (the "Equipment Credit Facility") with Silicon Valley Bank (the "Bank"). Under the Equipment Credit Facility, for a one-year period, we could borrow up to \$3.5 million in the aggregate to finance certain equipment purchases (including reimbursement of certain previously-made

purchases). Advances made under the Equipment Credit Facility would bear interest at the Bank's prime rate, as determined, plus 0.5% and payable in thirty-six (36) consecutive monthly payments following the funding date of that advance. The Equipment Credit Facility, if not sooner terminated in accordance with its terms, expires on June 1, 2010.

On March 31, 2008, we entered into a second Loan and Security Agreement (the "Revolving Credit Facility") with the Bank. Under the terms of the Revolving Credit Facility, the Bank agreed to provide us with a credit line up to \$5 million.



On May 13, 2008, the Bank amended the Equipment Credit Facility and the Revolving Credit Facility, modifying our net income profitability covenant requirements in exchange for a three quarters percent (0.75%) increase in our interest rate and waiver restructuring fee equal to one half percent (0.5%) of amounts outstanding under the Equipment Credit Facility and committed under the Revolving Credit Facility. In addition, our Equipment Credit Facility balance was to be factored in when calculating our borrowing base under the Revolving Credit Facility.

On March 31, 2009, the Bank extended the expiration of the Revolving Credit Facility under the same terms in order to allow both parties the time to negotiate an expansion of the credit limit contingent upon us qualifying for an Export-Import Bank loan guarantee.

On June 22, 2009, we entered into two separate credit facilities with the Bank providing for credit lines of up to \$8 million in the aggregate: (i) an Amended and Restated Loan and Security Agreement (the "Restated Revolving Credit Facility") pursuant to which the Bank agreed to provide us with a credit line of up to \$3 million and (ii) an Export-Import Bank Loan and Security Agreement (the "Ex-Im Facility") pursuant to which the Bank agreed to provide us with a credit line of up to \$5 million to be guaranteed by the Export-Import Bank of the United States (the "EXIM Bank"). Our obligations under these two credit facilities were secured by substantially all of our assets.

In addition, under the Restated Revolving Credit Facility, our existing Equipment Credit Facility with the Bank was amended whereby the Bank and the Company agreed that there would be no additional availability under such facility and, based on an outstanding principal amount of \$1.2 million on June 22, 2009, we would continue to make monthly installments of principal of \$97 thousand plus accrued interest until the outstanding balance was paid in full (the "Equipment Term Loan").

We were not in compliance with its credit facilities tangible net worth covenant as of September 30, 2009, and was unlikely to be in compliance on a going forward basis. Accordingly, in November 2009, we entered into an agreement to amend and restate its two credit facilities to more closely match our business model and which contain a waiver of any prior financial covenant defaults.

On November 16, 2009, we entered into two separate amended and restated credit facilities with the Bank continuing to provide for credit lines of up to \$8 million in the aggregate: (i) a Second Amended and Restated Loan and Security Agreement (the "Second Restated Revolving Credit Facility") pursuant to which the Bank agreed to continue to provide us with a credit line of up to \$3 million and (ii) an Amendment and Restated Export-Import Bank Loan and Security Agreement (the "Restated Ex-Im Facility") pursuant to which the Bank agreed to continue to provide us with a credit line of up to \$5 million to be guaranteed by the EXIM Bank.

Our obligations under these two amended credit facilities are secured by substantially all of our assets. Advances under the Second Restated Revolving Credit Facility are limited to 80% of eligible receivables. Interest on outstanding borrowings accrues at a rate per annum equal to the greater of (i) the prime rate plus 3.0% or (ii) 9.0% (9.0% as of December 31, 2009); with reductions in the rate if certain events occur, as defined. Our obligations under the Restated Ex-Im Facility are secured by substantially all of our assets. Advances under the Restated Ex-Im Facility are limited to (i) 90% of eligible receivables subject to a suitable foreign currency hedge agreement if applicable, plus (ii) 75% of all other eligible receivables billed in foreign currency, plus (iii) the 50% of the value of eligible inventory, as defined. Interest on outstanding borrowings accrues at a rate per annum equal to the greater of (i) the prime rate plus 3.0% or (ii) 9.0% (9.0% as of December 31, 2009); with reductions in the rate if certain events occur, as defined.

In addition, under the Second Restated Revolving Credit Facility, with respect to our outstanding Equipment Term Loan with the Bank, we must continue to make monthly installments of principal of \$97 thousand plus accrued interest until the outstanding balance is paid in full. Interest on the Equipment Term Loan continues to accrue at a rate per annum equal to the greater of (i) the prime rate plus 1.75% or (ii) 7.75% (7.75% as of December 31, 2009).

Under the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility, as long as any commitment remains outstanding under the facilities, we must comply with a financial covenant by maintaining cash and availability line of \$1.0 million. In addition, until all amounts under the credit facilities with the Bank are repaid, covenants under the credit facilities impose restrictions on our ability to, among other things, incur additional indebtedness, create or permit liens on our assets, merge, consolidate or dispose of assets (other than in the ordinary course of business), make dividend and other restricted payments, make certain debt or equity investments, make certain acquisitions, engage in certain transactions with affiliates or change the business conducted by us. Any failure by us to comply with the covenants and obligations under the credit facilities could result in an event of default, in which case the Bank may be entitled to declare all amounts owed to be due and payable immediately. The maturity date for each of these facilities is May 31, 2010.

The Equipment Term Loan's principal balance outstanding was \$583 thousand and \$1.8 million at December 31, 2009 and 2008, respectively. Advances outstanding under our Second Restated Revolving Credit Facility was \$1.0 million and \$1.5 million at December 31, 2009 and 2008, respectively. Advances outstanding under the Restated Ex-Im Facility as of December 31, 2009 were \$339.6 thousand. Availability under the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility was \$210 thousand and \$935 thousand, respectively, as of December 31, 2009.

### Gains on Termination of Contracts

On September 1, 2008, Nisshinbo delivered a letter to us stating its intention to terminate the Consortium Agreement entered into between Nisshinbo and us on May 16, 2005. In accordance with the Consortium Agreement, Nisshinbo provided its 180 day prior notice to terminate the Consortium Agreement effective as of February 28, 2009. However, on November 28, 2008, we signed the Separation Agreement with Nisshinbo that, among other things, accelerated the termination of the Consortium Agreement and the payment by Nisshinbo to us of an early termination penalty. Under the Separation Agreement, the termination of the Consortium Agreement was effective as of November 30, 2008.

On August 29, 2008, we delivered to Principia a Notice of Breach and Pending Termination of a the Manufacturing Agreement, dated August 29, 2006, by and between Spire Semiconductor and Principia. Under the terms of the Manufacturing Agreement, Principia made an up-front payment for nonrecurring engineering and facility access costs and was required to make monthly facility availability payments throughout the term of the agreement. As a result of Principia's failure to make monthly facility availability payments in 2008, we have fully reserved \$225 thousand against Principia's accounts receivable balance. We entered into a mutual standstill agreement with Principia, which expired on March 15, 2009. The purpose of the standstill was to give the parties additional time to negotiate a resolution.

On March 27, 2009, Spire Semiconductor and Principia mutually agreed to terminate the Manufacturing Agreement for convenience and entered into the Novation Agreement. Under the terms of the Novation Agreement, both parties agreed to terminate technology licenses that were granted to each other under the terms of the Manufacturing Agreement and Spire Semiconductor was released from its production requirements to Principia. Principia was released from paying its future facility availability payments due under the Manufacturing Agreement but will be required to pay facility availability payments of \$300 thousand. Spire Semiconductor holds 67,500 shares of Principia stock as collateral against the outstanding facility availability payments. During the three months ended March 31, 2009, we accelerated the amortization of deferred revenue and recognized \$1.54 million as a gain on termination of contract related to the termination of the Manufacturing Agreement.

On June 18, 2009, we entered into a settlement agreement with Marubeni Corporation with respect to the License Agreement dated April 1, 2003 for the license of manufacturing and distribution in Japan of our solar photovoltaic modular manufacturing equipment. Under the terms of the settlement agreement, both parties agreed to terminate the License Agreement including but not limited to the eighteen (18) month non-compete obligation. As a result of the settlement, we received a payment of \$200 thousand in the second quarter of 2009.

In the fourth quarter of 2009, the we determined that three purchase and sale agreements with Jiangxi Gemei Sci-Tech., LLC ("Jiangxi") related to a module equipment line and cell equipment line were terminated due to a breach of contract by Jiangxi. Jiangxi had failed to make payments as required by the agreements and has not responded to numerous communications by us. We made commitments to purchase equipment on behalf of Jiangxi and due to Jiangxi not making contractual payments, we entered into settlement agreements with these vendors. As a result of deposits paid by Jiangxi less settlements paid to vendors and inventory written off, we recognized a gain on termination of contracts of \$1.4 million.

### Cash Gain (Loss) from Operations

We have incurred operating losses before non-recurring gains in 2009. Loss from continuing operations, before gains on termination of contracts, was \$12.5 million in 2009. Income from continuing operations, before gains on termination of contracts, was \$413 thousand in 2008. The cash gain (loss) from continuing operations, as calculated in the table below, was \$(7.9) million and \$4.0 million in 2009 and 2008, respectively. The gain in 2008 was primarily attributed to margins from our solar business unit. As of December 31, 2009, we had unrestricted cash and

cash equivalents of \$9.0 million compared to unrestricted cash and cash equivalents of \$6.0 million as of December 31, 2008. We had numerous options on how to fund future operational losses or working capital needs, including but not limited to sales of equity, bank debt or the sale or license of assets and technology, as we have done in the past; however, there are no assurances that we will be able to sell equity, obtain or access bank debt, or sell or license assets or technology on a timely basis and at appropriate values. We have developed several plans including cost containment efforts and outside financing to offset a decline in business due to the recent global economic recession. As a result, we believe we have sufficient resources to finance our current operations through at least December 31, 2010.

| (in thousands)   | Years Ended December 31, |          |
|--|--------------------------|----------|
|  | 2009                     | 2008     |
| Income (loss) from operations                            | \$ (9,340 )              | \$ 7,174 |
| Gain on termination of contracts                         | (3,123 )                 | (6,761 ) |
| Adjusted loss from operations                            | (12,463 )                | 413      |
| Depreciation and amortization                            | 1,519                    | 1,850    |
| Loss on equity investment in joint venture               | 1,023                    | 807      |
| Deferred compensation                                    | 659                      | (487 )   |
| Deferred rent  | 279                      | 275      |
| Stock-based compensation                                 | 585                      | 754      |
| Provision for inventory and accounts receivable reserves | 468                      | 357      |
| Cash gain (loss) from continuing operations              | \$ (7,930 )              | \$ 3,969 |

#### Contractual Obligations, Commercial Commitments and Off-Balance Sheet Arrangements.

The following table summarizes our gross contractual obligations at December 31, 2009 and the maturity periods and the effect that such obligations are expected to have on its liquidity and cash flows in future periods:

| Contractual Obligations<br>(in thousands)       | Total    | Payments Due by Period |                |                |                      |
|---|----------|------------------------|----------------|----------------|----------------------|
|   |          | Less than<br>1 Year    | 2 - 3<br>Years | 4 - 5<br>Years | More Than<br>5 Years |
| Equipment Credit Facility (SVB)                 | \$595    | \$595                  | —              | —              | —                    |
| Second Restated Revolving Credit Facility (SVB) | \$1,342  | \$1,342                | —              | —              | —                    |
| Purchase obligations                            | \$1,995  | \$1,995                | —              | —              | —                    |
| Unrelated party capital leases                  | \$173    | \$54                   | \$96           | \$23           |                      |
| Operating leases:                               |          |                        |                |                |                      |
| Unrelated party operating leases                | \$355    | \$178                  | \$142          | \$35           | —                    |
| Related party operating leases                  | \$13,984 | \$3,243                | \$6,818        | \$2,903        | \$1,020              |

Purchase obligations include all open purchase orders outstanding regardless of whether they are cancelable or not. Included in purchase obligations are raw material and equipment needed to fulfill customer orders.

Equipment Credit Facility obligations outlined above include both the principal and interest components of these contractual obligations. The Second Restated Revolving Credit Facility does not include an interest component to the contractual obligation.

Outstanding letters of credit totaled \$1.5 million and \$4.2 million at December 31, 2009 and 2008, respectively. The letters of credit secure performance obligations and purchase commitments, and allow holders to draw funds up to the face amount of the letter of credit if we do not perform as contractually required. These letters of credit expire through 2010 and are 100% secured by cash, short-term investments and the Second Restated Revolving Credit Facility.

Recent Accounting Pronouncements

Effective July 1, 2009, we adopted the Financial Accounting Standards Board (“FASB”) Accounting Standards Codification (“ASC” or “Codification”), Generally Accepted Accounting Principles (“ASC 105-10”). The Codification, which was issued in June 2009, is the new source of authoritative U.S. GAAP for the Securities and Exchange Commission (“SEC”) registrants. The Codification reorganizes current U.S. GAAP into a topical format that eliminates the previous U.S. GAAP hierarchy and establishes two levels of U.S. GAAP – authoritative and non-authoritative. The Codification

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superseded all existing non-SEC accounting and reporting standards upon its effective date and carries the same level of authority as pronouncements issued under the previous hierarchy of U.S. GAAP. The adoption of the Codification did not have a significant impact on our Condensed Consolidated Financial Statements.

In October 2009, the FASB issued an amendment to ASC 605, Revenue Recognition, on the subtopic 605-25, Multiple-Element Arrangements. The amendment impacts the determination of when the individual deliverables included in a multiple-element arrangement may be treated as separate units of accounting. Additionally, the amendment modifies the manner in which the transaction consideration is allocated across the separately identified deliverables by no longer permitting the residual method of allocating arrangement consideration. The amendment is effective for revenue arrangement entered or materially modified in fiscal years beginning on or after June 15, 2010, however early adoption is permitted. We do not expect these new standards to significantly impact our consolidated financial statements.

Effective July 1, 2009, we adopted ASC 855, Subsequent Events. The pronouncement establishes recognition and disclosure standards for events that occur after the balance sheet date but before the financial statements are issued or are available to be issued. This guidance is effective on a prospective basis for interim periods ending after June 15, 2009. The adoption of the pronouncement did not have a significant impact on our Condensed Consolidated Financial Statements.

Effective January 1, 2008, we adopted provisions of ASC 820-10, Fair Value Measurements and Disclosures, relative to financial assets and liabilities. In February 2008, the FASB issued ASC paragraph 820-10-50-8A, Effective Date of ASC 820-10, which provides a one year deferral of the effective date of ASC 820-10 for non-financial assets and non-financial liabilities, except those that are recognized or disclosed in the financial statements at fair value at least annually. Effective January 1, 2009, we adopted the provisions of ASC 820-10 with respect to our non-financial assets and non-financial liabilities. The adoption of ASC 820-10 did not have an impact on our financial position or results of operations.

In March 2008, the FASB issued an Accounting Standards Update to ASC 815, Derivatives and Hedging. The update to ASC 815 requires enhanced disclosures about an entity's derivative and hedging activities. Entities are required to provide enhanced disclosures about (a) how and why an entity uses derivative instruments, (b) how derivative instruments and related hedged items are accounted for and its related interpretations, and (c) how derivative instruments and related hedged items affect an entity's financial position, financial performance, and cash flows. This update is effective for financial statements issued for fiscal years and interim periods beginning after November 15, 2008, with early application encouraged. The update to ASC 815 encourages, but does not require, comparative disclosures for earlier periods at initial adoption. The adoption of the update to ASC 815 did not have a material impact on our financial position or results of operations.

#### Impact of Inflation and Changing Prices

Historically, our business has not been materially impacted by inflation. Manufacturing equipment and solar systems are generally quoted, manufactured and shipped within a cycle of approximately nine months, allowing for orderly pricing adjustments to the cost of labor and purchased parts. We have not experienced any negative effects from the impact of inflation on long-term contracts. Our service business is not expected to be seriously affected by inflation because its procurement-production cycle typically ranges from two weeks to several months, and prices generally are not fixed for more than one year. Research and development contracts usually include cost escalation provisions.

#### Foreign Currency Fluctuation

We sell almost exclusively in U.S. dollars, generally against an irrevocable confirmed letter of credit through a major United States bank. Accordingly, we are not directly affected by foreign exchange fluctuations on our current orders.

However, fluctuations in foreign exchange rates do have an effect on our customers' access to U.S. dollars and on the pricing competition on certain pieces of equipment that we sell in selected markets. In addition, purchases made and historic royalties received under our Consortium Agreement with Nisshinbo are in Japanese yen. In addition, we received Japanese yen related to the termination of the Consortium Agreement in 2008. We have committed to purchase certain pieces of equipment from European and Japanese vendors; these commitments are denominated in Euros and Yen, respectively. We bear the risk of any currency fluctuations that may be associated with these commitments. We attempt to hedge known transactions when possible to minimize foreign exchange risk. The hedging activities during 2009 and 2008 were not material at any point during those years. Foreign exchange loss included in other expense was \$258 thousand and \$430 thousand for the year ended December 31, 2009 and 2008, respectively.

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## Related Party Transactions

On November 30, 2007, we entered into a new Lease Agreement (the "Bedford Lease") with SPI-Trust, with respect to 144,230 square feet of space comprising the entire building in which we have occupied space since December 1, 1985. The term of the Bedford Lease commenced on December 1, 2007 and continues for five (5) years until November 30, 2012. We have the right to extend the term of the Bedford Lease for an additional five (5) year period. The annual rental rate for the first year of the Lease is \$12.50 per square foot on a triple net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. The annual rental rate increases on each anniversary by \$0.75 per square foot. If we exercise our right to extend the term of the Bedford Lease, the annual rental rate for the first year of the extended term will be the greater of (a) the rental rate in effect immediately preceding the commencement of the extended term or (b) the market rate at such time, and on each anniversary of the commencement of the extended term the rental rate will increase by \$0.75 per square foot. We believe that the terms of the Bedford Lease are commercially reasonable. Rent expense under the Bedford Lease was \$2.0 million for the year ended December 31, 2009 and 2008.

On August 29, 2008, we entered into a new Lease Agreement (the "Hudson Lease") with SPI-Trust, with respect to 90 thousand square feet of space comprising the entire building in which Spire Semiconductor has occupied space since June 1, 2003. The term of the Hudson Lease commenced on September 1, 2008, and continues for seven (7) years until August 31, 2015. We have the right to extend the term of the Hudson Lease for an additional five (5) year period. The annual rental rate for the first year of the Hudson Lease is \$12.50 per square foot on a triple-net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. The annual rental rate increases on each anniversary by \$0.75 per square foot. If we exercise our right to extend the term of the Hudson Lease, the annual rental rate for the first year of the extended term will be the greater of: (a) the rental rate in effect immediately preceding the commencement of the extended term; or (b) the market rate at such time, and on each anniversary of the commencement of the extended term the rental rate will increase by \$0.75 per square foot. In addition, we are required to deposit with SPI-Trust \$300 thousand as security for performance by the Company for its covenants and obligations under the Hudson Lease. SPI-Trust is responsible, at its sole expense, to make certain defined tenant improvements to the building. We believe that the terms of the Hudson Lease are commercially reasonable and reflective of market rates. The lease agreement does not provide for a transfer of ownership at any point. The Hudson Lease is classified as a related party operating lease. Rent expense under the Hudson Lease was \$1.3 million and \$443 thousand for the year ended December 31, 2009 and 2008, respectively.

## Critical Accounting Policies

The preparation of financial statements in accordance with accounting principles generally accepted in the United States requires us 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 revenues and expenses during the reporting period. Among the significant estimates affecting our consolidated financial statements are those relating to revenue recognition, reserves for doubtful accounts and sales returns and allowances, reserve for excess and obsolete inventory, impairment of long-lived assets, stock-based compensation, income taxes, and warranty reserves. We regularly evaluate our estimates and assumptions based upon historical experience and various other factors that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. To the extent actual results differ from those estimates, our future results of operations may be affected. We believe the following critical accounting policies affect our more significant judgments and estimates used in the preparation of our consolidated financial statements. Refer to Footnote 2 of our notes to consolidated financial statements for a description of our significant accounting policies.

## Revenue Recognition

We derive our revenues from continuing operations from three primary sources: (1) commercial products including, but not limited to, solar energy manufacturing equipment, solar energy systems and solar energy materials; (2) Biomedical and semiconductor processing services; and (3) United States government funded research and development contracts

We generally recognize product revenue upon shipment of products provided there are no uncertainties regarding customer acceptance, persuasive evidence of an arrangement exists, the sales price is fixed or determinable, and collectibility is reasonably assured. These criteria are generally met at the time of shipment when the risk of loss and title passes to the customer.

Our OEM capital equipment solar energy business builds complex customized machines to order for specific customers. Most orders are sold on a FOB Bedford, Massachusetts (or EX-Works Factory) basis and other orders are sold on a CIP, or on rare situations, a DDU basis. It is our policy to recognize revenues for this equipment as title of the product has passed to the customer, as customer acceptance is obtained prior to shipment and the equipment is expected to operate the same in the customer's environment as it does in our environment. When an arrangement with the customer includes future obligations or customer acceptance, revenue is recognized when those obligations are met or customer acceptance has been achieved. For arrangements with multiple elements, we allocate total fees under contract to each element using the relative fair value method and revenue is recognized upon delivery of each element. If we are not able to establish fair value of undelivered elements, all revenue is deferred until customer final acceptance is obtained.

Our solar systems business provides photovoltaic systems for application to powering buildings with connection to the utility grid. It is our policy to recognize revenues for these systems as title passes, the customer accepts the system installation and interconnection to the grid is achieved.

Our solar materials business supplies photovoltaic materials under a United States government contract. It is our policy to recognize revenues for these materials as title passes and the government accepts the materials.

We recognize revenues and estimated profits on long-term government contracts on the accrual basis where the circumstances are such that total profit can be estimated with reasonable accuracy and ultimate realization is reasonably assured. We accrue revenue and profit utilizing the percentage of completion method using a cost-to-cost methodology. A percentage of the contract revenues and estimated profits is determined utilizing the ratio of costs incurred to date to total estimated cost to complete on a contract by contract basis. Profit estimates are revised periodically based upon changes and facts, and any losses on contracts are recognized immediately. Some of the contracts include provisions to withhold a portion of the contract value as retainage until such time as the United States government performs an audit of the cost incurred under the contract. Our policy is to take into revenue the full value of the contract, including any retainage, as it performs against the contract since we have not experienced any substantial losses as a result of audits performed by the United States government.

#### Allowance for Doubtful Accounts

We maintain allowances for doubtful accounts for estimated losses resulting from the inability of our customers to pay amounts due. We actively pursue collection of past due receivables as the circumstances warrant. Customers are contacted to determine the status of payment and senior accounting and operations management are included in these efforts as is deemed necessary. A specific reserve will be established for past due accounts when it is probable that a loss has been incurred and we can reasonably estimate the amount of the loss. We do not record an allowance for government receivables and invoices backed by letters of credit as realizability is reasonably assured. Bad debts are written off against the allowance when identified. There is no dollar threshold for account balance write-offs. While rare, a write-off is only recorded when all efforts to collect the receivable have been exhausted.

#### Impairment of Long-lived Assets

We account for long-lived assets in accordance with the provisions of ASC 360-10-5-4, Impairment or Disposal of Long-Lived Assets. ASC 360-10-5-4 requires that long-lived assets and certain identifiable intangibles be reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. We measure recoverability of assets to be held and used by a comparison of the carrying amount of an asset to future 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 exceed the fair value of the assets. We report assets to be disposed of at the lower of the carrying amount or fair value less costs to

sell.

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### Stock-Based Compensation

We account for its stock-based compensation plans in accordance with the fair value recognition provisions of ASC 718 Compensation—Stock Compensation. We use the Black-Scholes option pricing model as our method for determining the fair value of stock option grants. ASC 718 requires the fair value of all share-based awards that are expected to vest to be recognized in the statements of operations over the service or vesting period of each award. We use the straight-line method of attributing the value of stock-based compensation expense for all stock option grants over the requisite service period.

### Warranty

We provide warranties on certain products and services. Our warranty programs are described below:

Spire Solar Equipment warrants solar energy module manufacturing equipment sold for a total of 360 days, the first 90 days of which include the replacement of defective component parts and the labor to correct the defect and the next 270 days of which include only the cost of defective component parts.

Spire Biomedical warrants that any of its catheter products found to be defective will be replaced. No warranty is made that the failure of the product will not occur, and Spire disclaims any responsibility for any medical complications. Spire Biomedical warrants that its services only will meet the agreed upon specifications.

Spire Semiconductor warrants that its products will meet the agreed upon specifications.

We provide for the estimated cost of product warranties, determined primarily from historical information, at the time product revenue is recognized. Should actual product failure warranties differ from our estimates, revisions to the estimated warranty liability would be required.

### Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Not required as we are a smaller reporting company.

Item 8. Financial Statements

Consolidated Financial Statements

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Stockholders  
of Spire Corporation:

We have audited the consolidated balance sheets of Spire Corporation and Subsidiaries as of December 31, 2009 and 2008 and the related consolidated statements of operations, stockholders' equity and comprehensive income (loss) and cash flows for the years then ended. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement. The Company is not required to have, nor were we engaged to perform, audits of its internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, 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. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Spire Corporation and Subsidiaries as of December 31, 2009 and 2008, and the results of their operations and their cash flows for the years then ended, in conformity with accounting principles generally accepted in the United States of America.

CATURANO AND COMPANY, P.C.

Boston, Massachusetts  
March 31, 2010

SPIRE CORPORATION AND SUBSIDIARIES  
CONSOLIDATED BALANCE SHEETS  
(in thousands, except share and per share amounts)

|   | December<br>31,<br>2009 | December<br>31,<br>2008 |
|---|-------------------------|-------------------------|
| Assets  |                         |                         |
| Current assets  |                         |                         |
| Cash and cash equivalents   | \$8,999                 | \$5,971                 |
| Restricted cash – current portion   | 1,501                   | 4,167                   |
|   | 10,500                  | 10,138                  |
| Accounts receivable – trade, net  | 5,890                   | 8,098                   |
| Inventories, net  | 20,489                  | 16,855                  |
| Deferred cost of goods sold   | 6,588                   | 17,088                  |
| Deposits on equipment for inventory   | 583                     | 3,419                   |
| Prepaid expenses and other current assets   | 777                     | 424                     |
| Current assets of discontinued operations and assets held for sale  | 154                     | 1,854                   |
| Total current assets  | 44,981                  | 57,876                  |
| Property and equipment, net   | 5,364                   | 6,075                   |
| Intangible and other assets, net  | 742                     | 480                     |
| Available-for-sale investments, at quoted market value (cost of \$1,714 and \$1,859 at December 31, 2009 and December 31, 2008, respectively) | 1,948                   | 1,434                   |
| Equity investment in joint venture  | —                       | 1,473                   |
| Deposit – related party   | 300                     | 300                     |
| Non-current assets of discontinued operations and assets held for sale  | 58                      | 380                     |
| Total other assets  | 3,048                   | 4,067                   |
| Total assets  | \$53,393                | \$68,018                |
| Liabilities and Stockholders' Equity  |                         |                         |
| Current liabilities   |                         |                         |
| Current portion of capital lease obligation   | \$39                    | \$—                     |
| Current portion of equipment and revolving line of credit   | 1,925                   | 2,667                   |
| Accounts payable  | 8,676                   | 4,842                   |
| Accrued liabilities   | 7,233                   | 8,150                   |
| Current portion of advances on contracts in progress  | 21,708                  | 34,509                  |
| Liabilities of discontinued operations  | 1,682                   | 873                     |
| Total current liabilities   | 41,263                  | 51,041                  |
| Long-term portion of capital lease obligation   | 102                     | —                       |
| Long-term portion of equipment line of credit   | —                       | 583                     |
| Long-term portion of advances on contracts in progress  | 4                       | 1,149                   |
| Deferred compensation   | 1,948                   | 1,434                   |
| Other long-term liabilities   | 572                     | 293                     |
| Total long-term liabilities   | 2,626                   | 3,459                   |
| Total liabilities   | 43,889                  | 54,500                  |



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Stockholders' equity

|  |           |          |
|--|-----------|----------|
| Common stock, \$0.01 par value; 20,000,000 shares authorized; 8,334,688 and 8,330,688 shares issued and outstanding on December 31, 2009 and December 31, 2008, respectively | 83        | 83       |
| Additional paid-in capital   | 21,383    | 20,774   |
| Accumulated deficit  | (12,196 ) | (6,914 ) |
| Accumulated other comprehensive income (loss)  | 234       | (425 )   |
| Total stockholders' equity   | 9,504     | 13,518   |
| Total liabilities and stockholders' equity   | \$53,393  | \$68,018 |

The accompanying notes are an integral part of these consolidated financial statements.

SPIRE CORPORATION AND SUBSIDIARIES  
CONSOLIDATED STATEMENTS OF OPERATIONS

(in thousands, except share and per share amounts)

|  | Years Ended December |          |
|--|----------------------|----------|
|  | 31,                  |          |
|  | 2009                 | 2008     |
| Net sales and revenues   |                      |          |
| Sales of goods   | \$57,761             | \$50,336 |
| Contract research, service and license revenues                                | 12,110               | 14,628   |
| Total net sales and revenues   | 69,871               | 64,964   |
| Cost of sales and revenues   |                      |          |
| Cost of goods sold   | 54,246               | 35,588   |
| Cost of contract research, services and licenses                               | 9,164                | 10,003   |
| Total cost of sales and revenues   | 63,410               | 45,591   |
| Gross margin   | 6,461                | 19,373   |
| Operating expenses   |                      |          |
| Selling, general and administrative expenses                                   | 17,836               | 18,157   |
| Internal research and development expenses                                     | 1,088                | 803      |
| Total operating expenses   | 18,924               | 18,960   |
| Gain on termination of contracts   | 3,123                | 6,761    |
| Income (loss) from continuing operations                                       | (9,340 )             | 7,174    |
| Interest expense, net  | (284 )               | (212 )   |
| Loss on equity investment in joint venture                                     | (1,023 )             | (807 )   |
| Other expense  | (258 )               | (430 )   |
| Total other expense, net   | (1,565 )             | (1,449 ) |
| Income (loss) from continuing operations before income tax benefit (provision) | (10,905 )            | 5,725    |
| Income tax benefit (provision) - continuing operations                         | 2,241                | (270 )   |
| Net income (loss) from continuing operations                                   | (8,664 )             | 5,455    |
| Loss from discontinued operations before sale of business unit                 | (2,105 )             | (680 )   |
| Gain on sale of business unit  | 7,741                |          |
| Income tax provision - discontinued operations                                 | (2,254 )             |          |
| Net income (loss) from discontinued operations, net of tax                     | 3,382                | (680 )   |
| Net income (loss)  | \$(5,282 )           | \$4,775  |
| Basic income (loss) per share:   |                      |          |
| From continuing operations after income tax                                    | \$(1.04 )            | \$0.65   |
| From discontinued operations, net of tax                                       | 0.41                 | (0.08 )  |
| Basic income (loss) per share  | \$(0.63 )            | \$0.57   |
| Diluted income (loss) per share:   |                      |          |
| From continuing operations after income tax                                    | \$(1.04 )            | \$0.64   |
| From discontinued operations, net of tax                                       | 0.41                 | (0.08 )  |

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|  |           |           |
|--|-----------|-----------|
| Diluted income (loss) per share  | \$ (0.63  | ) \$ 0.56 |
| Weighted average number of common and common equivalent shares outstanding – basic   | 8,334,304 | 8,328,592 |
| Weighted average number of common and common equivalent shares outstanding – diluted | 8,334,304 | 8,464,623 |

The accompanying notes are an integral part of these consolidated financial statements.

SPIRE CORPORATION AND SUBSIDIARIES  
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY AND COMPREHENSIVE INCOME (LOSS)  
(in thousands, except share amounts)

|   | Common Stock<br>Shares | Common Stock<br>Amount | Additional<br>Paid-in<br>Capital | Accumulated<br>Deficit | Accumulated<br>Other<br>Comprehensive<br>Income (loss) | Total    |
|---|------------------------|------------------------|----------------------------------|------------------------|--|----------|
| Balance, December 31, 2007  | 8,321,188              | \$83                   | \$19,999                         | \$ (11,689 )           | \$ 62  | \$8,455  |
| Exercise of stock options   | 9,500                  |                        | 21                               | —                      | —  | 21       |
| Stock-based compensation  |                        |                        | 754                              |                        |  | 754      |
| Net unrealized loss on<br>available for sale marketable<br>securities | —                      | —                      | —                                | —                      | (487 )   | (487 )   |
| Net income  | —                      | —                      | —                                | 4,775                  | —  | 4,775    |
| Balance, December 31, 2008  | 8,330,688              | 83                     | 20,774                           | (6,914 )               | (425 )   | 13,518   |
| Exercise of stock options   | 4,000                  |                        | 24                               | —                      | —  | 24       |
| Stock-based compensation  |                        |                        | 585                              |                        |  | 585      |
| Net unrealized gain on<br>available for sale marketable<br>securities | —                      | —                      | —                                | —                      | 659  | 659      |
| Net loss  | —                      | —                      | —                                | (5,282 )               | —  | (5,282 ) |
| Balance, December 31, 2009  | 8,334,688              | \$83                   | \$21,383                         | \$ (12,196 )           | \$ 234   | \$9,504  |

| (in thousands)  | Years Ended December<br>31, |         |
|---|-----------------------------|---------|
|   | 2009                        | 2008    |
| Comprehensive income (loss) is calculated as follows:                       |                             |         |
| Net income (loss)   | \$(5,282 )                  | \$4,775 |
| Other comprehensive gain (loss) on available for sale marketable securities | 659                         | (487 )  |
| Comprehensive income (loss)   | \$(4,623 )                  | \$4,288 |

The accompanying notes are an integral part of these consolidated financial statements.

SPIRE CORPORATION AND SUBSIDIARIES  
CONSOLIDATED STATEMENTS OF CASH FLOWS  
(in thousands)

|   | For Years Ended<br>December 31, |            |
|---|---------------------------------|------------|
|   | 2009                            | 2008       |
| Cash flows from operating activities:   |                                 |            |
| Net income (loss)   | \$(5,282                        | ) \$4,775  |
| Less: Net income (loss) from discontinued operations, net of tax                          | 3,382                           | (680 )     |
| Net income (loss) from continuing operations  | (8,664                          | ) 5,455    |
| Adjustments to reconcile net loss to net cash provided by (used in) operating activities: |                                 |            |
| Depreciation and amortization   | 1,519                           | 1,850      |
| Loss on equity investment in joint venture  | 1,023                           | 807        |
| Gain on sale of asset   | —                               | (60 )      |
| Deferred tax benefit  | (2,254                          | ) —        |
| Deferred compensation   | 659                             | (487 )     |
| Stock-based compensation  | 585                             | 754        |
| Provision for accounts receivable reserves  | 120                             | 293        |
| Provision for inventory reserve   | 348                             | 64         |
| Changes in assets and liabilities:  |                                 |            |
| Restricted cash   | 2,666                           | (3,776 )   |
| Accounts receivable   | 2,088                           | 2,543      |
| Inventories   | (3,982                          | ) (6,690 ) |
| Deferred cost of goods sold   | 10,500                          | (9,044 )   |
| Deposits, prepaid expenses and other current assets                                       | 2,483                           | (958 )     |
| Accounts payable, accrued liabilities and other liabilities                               | 3,196                           | 5,042      |
| Deposit – related party   | —                               | 4          |
| Advances on contracts in progress   | (13,946                         | ) 9,663    |
| Net cash (used in) provided by operating activities of continuing operations              | (3,659                          | ) 5,460    |
| Net cash (used in) provided by operating activities of discontinued operations            | (160                            | ) 25       |
| Net cash (used in) provided by operating activities                                       | (3,819                          | ) 5,485    |
| Cash flows from investing activities:   |                                 |            |
| Proceeds from dissolution of joint venture  | 450                             | —          |
| Proceeds from sale of asset   | —                               | 61         |
| Purchase of property and equipment  | (622                            | ) (1,710 ) |
| Increase in intangible and other assets   | (294                            | ) (69 )    |
| Net cash used in investing activities of continuing operations                            | (466                            | ) (1,718 ) |
| Net cash provided by (used in) investing activities of discontinued operations            | 8,627                           | (36 )      |
| Net cash provided by (used in) investing activities                                       | 8,161                           | (1,754 )   |
| Cash flows from financing activities:   |                                 |            |
| Principal payments on capital lease obligations – related parties                         | —                               | (486 )     |
| Principal payments on capital lease obligations   | (13                             | ) —        |
| Principal payments on equipment line of credit  | (1,167                          | ) (1,167 ) |
| Principal (payments) borrowings on revolving line of credit                               | (158                            | ) 1,500    |
| Proceeds from exercise of stock options   | 24                              | 21         |
| Net cash used in financing activities   | (1,314                          | ) (132 )   |
|   | 3,028                           | 3,599      |

Net increase in cash and cash equivalents

|  |         |         |
|--|---------|---------|
| Cash and cash equivalents, beginning of period         | 5,971   | 2,372   |
| Cash and cash equivalents, end of period               | \$8,999 | \$5,971 |
| Supplemental disclosures of cash flow information:     |         |         |
| Interest paid  | \$300   | \$224   |
| Interest paid – related party                          | \$—     | \$9     |
| Interest received                                      | \$16    | \$21    |
| Income taxes paid (refunded)                           | \$135   | \$(2 )  |
| Supplemental disclosures of non-cash flow information: |         |         |
| Property and equipment purchased under capital lease   | \$154   | \$—     |

The accompanying notes are an integral part of these consolidated financial statements.

SPIRE CORPORATION AND SUBSIDIARIES  
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

December 31, 2009 and 2008

1. Description of the Business

Spire Corporation (“Spire” or the “Company”) develops, manufactures and markets highly-engineered products and services in three principal business areas: (i) capital equipment for the PV solar industry, (ii) biomedical and (iii) optoelectronics, generally bringing to bear expertise in materials technologies, surface science and thin films across all three business areas, discussed below.

In the PV solar area, the Company develops, manufactures and markets specialized equipment for the production of terrestrial photovoltaic modules from solar cells, provides photovoltaic systems for application to powering buildings with connection to the utility grid and supplies photovoltaic materials. The Company’s equipment has been installed in approximately 200 factories in 50 countries. In addition, the Company provides photovoltaic systems for applications to powering buildings with connection to the utility grid.

In the biomedical area, the Company provides value-added surface treatments to manufacturers of orthopedic and other medical devices that enhance the durability, antimicrobial characteristics or other material characteristics of their products; and performs sponsored research programs into practical applications of advanced biomedical and biophotonic technologies.

In the optoelectronics area, the Company provides custom compound semiconductor foundry and fabrication services on a merchant basis to customers involved in biomedical/biophotonic instruments, telecommunications and defense applications. Services include compound semiconductor wafer growth, other thin film processes and related device processing and fabrication services. The Company also provides materials testing services and performs services in support of sponsored research into practical applications of optoelectronic technologies.

On December 14, 2009, the Company completed the sale of its medical products business unit, which develops and markets coated and uncoated hemodialysis catheters and related devices for the treatment of chronic kidney disease (the “Medical Products Business Unit”), to Bard Access Systems, Inc. Accordingly, the results and assets of the Medical Products Business Unit are being presented herein as discontinued operations and assets held for sale. See Note 17 to the consolidated financial statements.

Operating results will depend upon revenue growth and product mix, as well as the timing of shipments of higher priced products from the Company's solar equipment line, delivery of solar systems and solar materials. Export sales, which amounted to 59% of net sales and revenues for 2009, continue to constitute a significant portion of the Company's net sales and revenues.

The Company has incurred operating losses before non-recurring gains in 2009. Loss from continuing operations, before gains on termination of contracts, was \$12.5 million in 2009. Income from continuing operations, before gains on termination of contracts, was \$413 thousand in 2008. The cash gain (loss) from continuing operations, as calculated in the table below, was \$(7.9) million and \$4.0 million in 2009 and 2008, respectively. The cash gain from continuing operations in 2008 was primarily attributed to margins from the Company’s solar business unit. As of December 31, 2009, the Company had unrestricted cash and cash equivalents of \$9.0 million compared to unrestricted cash and cash equivalents of \$6.0 million as of December 31, 2008. The Company has numerous options on how to fund future operational losses or working capital needs, including but not limited to unrestricted cash balances on hand, sales of equity, bank debt or the sale or license of assets and technology, as it has done in the past; however,

there are no assurances that the Company will be able to sell equity, obtain or access bank debt, or sell or license assets or technology on a timely basis and at appropriate values. The Company has developed several plans including cost containment efforts and outside financing to offset a decline in business due to the recent global economic recession. As a result, the Company believes it has sufficient resources to finance its current operations through at least December 31, 2010.



| (in thousands)   | Years Ended December 31, |          |
|--|--------------------------|----------|
|  | 2009                     | 2008     |
| Income (loss) from continuing operations                 | \$ (9,340 )              | \$ 7,174 |
| Gain on termination of contracts                         | (3,123 )                 | (6,761 ) |
| Adjusted loss from operations                            | (12,463 )                | 413      |
| Depreciation and amortization                            | 1,519                    | 1,850    |
| Loss on equity investment in joint venture               | 1,023                    | 807      |
| Deferred compensation                                    | 659                      | (487 )   |
| Deferred rent  | 279                      | 275      |
| Stock-based compensation                                 | 585                      | 754      |
| Provision for inventory and accounts receivable reserves | 468                      | 357      |
| Cash gain (loss) from continuing operations              | \$ (7,930 )              | \$ 3,969 |

## 2 Summary of Significant Accounting Policies

### (a) Principles of Consolidation

The consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries. The Company's joint venture with Gloria Solar was not consolidated but recognized using the equity method of accounting until its liquidation in the third quarter of 2009. See Note 16. All significant intercompany balances and transactions have been eliminated in consolidation.

### (b) Revenue Recognition

The Company derives its revenues from continuing operations from three primary sources: (1) commercial products including, but not limited to, solar energy manufacturing equipment, solar energy systems and solar energy materials; (2) biomedical and semiconductor processing services; and (3) United States government funded research and development contracts

The Company generally recognizes product revenue upon shipment of products provided there are no uncertainties regarding customer acceptance, persuasive evidence of an arrangement exists, the sales price is fixed or determinable, and collectibility is reasonably assured. These criteria are generally met at the time of shipment when the risk of loss and title passes to the customer.

The Company's OEM (original equipment manufacturer) capital equipment solar energy business builds complex customized machines to order for specific customers. Most orders are sold on a FOB (free on board) Bedford, Massachusetts (or EX-Works Factory) basis and other orders are sold on a CIP (carriage and insurance paid to), or on rare situations, a DDU (delivered duty unpaid) basis. It is the Company's policy to recognize revenues for this equipment as title of the product has passed to the customer, as customer acceptance is obtained prior to shipment and the equipment is expected to operate the same in the customer's environment as it does in the Company's environment. When an arrangement with the customer includes future obligations or customer acceptance, revenue is recognized when those obligations are met or customer acceptance has been achieved. For arrangements with multiple elements, the Company allocates total fees under contract to each element using the relative fair value method and revenue is recognized upon delivery of each element. If the Company is not able to establish fair value of undelivered elements, all revenue is deferred.

The Company's solar systems business provides photovoltaic systems for application to powering buildings with connection to the utility grid. It is the Company's policy to recognize revenues for these systems when title passes, the customer accepts the system installation and interconnection to the grid is achieved.

The Company's solar materials business supplies photovoltaic materials under a United States government contract. It is the Company's policy to recognize revenues for these materials as title passes and the government accepts the materials.

The Company recognizes revenues and estimated profits on long-term government contracts on a percent complete basis where the circumstances are such that total profit can be estimated with reasonable accuracy and ultimate realization is reasonably assured. The Company records revenue and profit utilizing the percentage of completion method using a cost-to-cost methodology. A percentage of the contract revenues and estimated profits is determined utilizing the ratio of costs incurred to date to total estimated cost to complete on a contract by contract basis. Profit estimates are revised

periodically based upon changes in facts, and any losses on contracts are recognized immediately. Some of the contracts include provisions to withhold a portion of the contract value as retainage until such time as the United States government performs an audit of the cost incurred under the contract. The Company's policy is to take into revenue the full value of the contract, including any retainage, as it performs against the contract since the Company has not experienced any substantial losses as a result of audits performed by the United States government.

(c) Cash and Cash Equivalents

Cash and cash equivalents include cash, time deposits and all highly liquid debt instruments with original maturities of three months or less. These investments are carried at cost, which approximates market value. Cash and cash equivalents are deposited at various area banks, and at times may exceed federally insured limits.

(d) Available-for-sale Investments

Available-for-sale securities consist of the following assets held as part of the Spire Corporation Non-Qualified Deferred Compensation Plan for the years ended December 31:

| (in thousands)                  | 2009     | 2008     |
|---------------------------------|----------|----------|
| Cash and short term investments | \$ 44    | \$ 74    |
| Fixed income                    | 377      | 231      |
| Equities                        | 1,527    | 1,129    |
|                                 | \$ 1,948 | \$ 1,434 |

These investments have been classified as available-for-sale investments and are reported at fair value, with unrealized gains and losses included in accumulated other comprehensive loss. As of December 31, 2009, the unrealized gain on these marketable securities was \$234 thousand and as of December 31, 2008, the unrealized loss on these marketable securities was \$425 thousand.

(e) Fair Value Measurements

Effective January 1, 2008, the Company adopted ASC 820-10, Fair Value Measurements and Disclosures. In February 2008, the FASB issued ASC paragraph 820-10-50-8A, Effective Date of ASC 820-10, which provides a one year deferral of the effective date of ASC 820-10 for non-financial assets and non-financial liabilities, except those that are recognized or disclosed in the financial statements at fair value at least annually. Effective January 1, 2009, the Company has adopted the provisions of ASC 820-10 with respect to its non-financial assets and non-financial liabilities. ASC 820-10 defines fair value, establishes a framework for measuring fair value, and expands disclosures about fair value measurements. The standard provides a consistent definition of fair value, which focuses on an exit price, which is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The standard also prioritizes, within the measurement of fair value, the use of market-based information over entity specific information and establishes a three-level hierarchy for fair value measurements based on the nature of inputs used in the valuation of an asset or liability as of the measurement date.

The hierarchy established under ASC 820-10 gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). As required by ASC 820-10, the Company's available for sale investments are classified within the fair value hierarchy based on the lowest level of input that is significant to the fair value measurement. The three levels of the fair value hierarchy under ASC 820, and its applicability to the Company's available-for-sale investments, are described below:

Level 1 – Pricing inputs are quoted prices available in active markets for identical investments as of the reporting date. As required by ASC 820, the Company does not adjust the quoted price for these investments, even in situations where the Company holds a large position and a sale could reasonably impact the quoted price.

Level 2 – Pricing inputs are quoted prices for similar investments, or inputs that are observable, either directly or indirectly, for substantially the full term through corroboration with observable market data. Level 2 includes investments valued at quoted prices adjusted for legal or contractual restrictions specific to these investments.

Level 3 – Pricing inputs are unobservable for the investment, that is, inputs that reflect the reporting entity's own assumptions about the assumptions market participants would use in pricing the asset or liability. Level 3 includes investments that are supported by little or no market activity.

The following table presents the financial instruments related to the Company's non-qualified deferred compensation plan carried at fair value on a recurring basis as of December 31, 2009 by ASC 820 valuation hierarchy (as defined above).

| (in thousands)                       | Level 1 | Level 2  | Level 3 | Total    |
|--------------------------------------|---------|----------|---------|----------|
| Cash and short term investments      | \$ 44   | \$ —     | \$ —    | \$ 44    |
| Fixed income                         | —       | 377      | —       | 377      |
| Equities                             | 556     | 971      | —       | 1,527    |
| Total available for-sale-investments | \$ 600  | \$ 1,348 | \$ —    | \$ 1,948 |
| Percent of total                     | 31 %    | 69 %     | —       | 100 %    |

The fair value of the Company's long term debt has been estimated by management based on the terms that it believes it could obtain in the current market for debt of the same terms and remaining maturities. Due to the short-term nature of the remaining maturities, frequency of amendments to its terms and the variable interest rates, the carrying value of the long-term debt approximates fair value at December 31, 2009 and 2008.

(f) Inventories

Inventories are stated at the lower of cost or market, cost being determined on a first-in, first-out (FIFO) basis. Judgments and estimates are used in determining the likelihood that goods on hand can be sold to customers. Historical inventory usage and current revenue trends are considered in estimating both excess and obsolete inventory. If actual product demand and market conditions are less favorable than those projected by management, additional inventory write-downs may be required.

(g) Property and Equipment

Property and equipment is stated at cost. Depreciation and amortization are provided using the straight-line method over the estimated useful lives of the respective assets, as follows:

|   |   |
|---|---|
| Building and equipment under capital lease    | Lesser of 5 years or remaining life of lease  |
| Machinery and equipment                       | 5 and 7 years                                 |
| Furniture and fixtures and computer equipment | 3 - 5 years                                   |
| Leasehold improvements                        | Lesser of 10 years or remaining life of lease |

Maintenance and repairs are charged to expense as incurred. Major renewals and betterments are added to property and equipment accounts at cost.

(h) Intangible and Other Assets

Patents amounted to \$98 thousand and \$68 thousand, net of accumulated amortization of \$712 thousand and \$680 thousand, at December 31, 2009 and 2008, respectively. Patent cost is primarily composed of cost associated with securing and registering patents that the Company has been awarded or that have been submitted to, and the Company believes will be approved by, the government. These costs are capitalized and amortized over their useful lives or terms, ordinarily five years, using the straight-line method. There are no expected residual values related to these patents. Amortization expense, relating to patents and licenses, was approximately \$32 thousand and \$33 thousand for the years ended December 31, 2009 and 2008, respectively.

For disclosure purposes, the table below includes future amortization expense for patents owned by the Company as well as estimated amortization expense related to patents that remain pending at December 31, 2009 of \$394 thousand. This estimated expense for patents pending assumes that the patents are issued immediately, and therefore are being amortized over five years on a straight-line basis. Estimated amortization expense for the periods ending December 31, is as follows:

| (in thousands) | Amortization<br>Expense |
|----------------|-------------------------|
| 2010           | \$ 114                  |
| 2011           | 108                     |
| 2012           | 96                      |
| 2013           | 91                      |
| 2014           | 83                      |
|                | \$ 492                  |

Also included in other assets are approximately \$250 thousand and \$10 thousand of refundable deposits made by the Company at December 31, 2009 and 2008, respectively.

(i) Long-lived Assets

The Company accounts for long-lived assets in accordance with the provisions of ASC 360-10-5-4, Impairment or Disposal of Long-Lived Assets. ASC 360-10-5-4 requires that long-lived assets and certain identifiable intangibles be reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. The Company measures recoverability of assets to be held and used 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 exceed the fair value of the assets. The Company reports assets to be disposed of at the lower of the carrying amount or fair value less costs to sell.

(j) Income Taxes

In accordance with ASC 740, Accounting for Income Taxes, the Company recognizes deferred income taxes based on the expected future tax consequences of differences between the financial statement basis and the tax basis of assets and liabilities, calculated using enacted tax rates in effect for the year in which the differences are expected to be reflected in the tax return. Valuation allowances are provided if, based on the weight of available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

The Company accounts for uncertain tax positions using a “more-likely-than-not” threshold for recognizing and resolving uncertain tax positions. The evaluation of uncertain tax positions is based on factors including, but not limited to, changes in tax law, the measurement of tax positions taken or expected to be taken in tax returns, the effective settlement of matters subject to audit, new audit activity and changes in facts or circumstances related to a tax position. The Company evaluates this tax position on a quarterly basis using a two-step process. The first step is a determination of whether the tax position should be recognized in the financial statements and the second step is the measurement of the tax position. The Company also accrues for potential interest and penalties, related to unrecognized tax benefits in income tax expense. The Company’s evaluation was performed for the tax years ended December 31, 2005, 2006, 2007, 2008 and 2009, the tax years which remain subject to audit by the Internal Revenue Service and state tax jurisdictions.

(k) Warranty

The Company provides warranties on certain of its products and services. The Company’s warranty programs are described below:

Spire Solar Equipment warrants solar energy module manufacturing equipment sold for a total of 360 days, the first 90 days of which include the replacement of defective component parts and the labor to correct the defect and the next 270 days of which include only the cost of defective component parts.

Spire Semiconductor warrants that its products will meet the agreed upon specifications.

The Company provides for the estimated cost of product warranties, determined primarily from historical information, at the time product revenue is recognized. Should actual product failure warranties differ from the Company’s estimates, revisions to the estimated warranty liability would be required. Product warranty liabilities are included in accrued liabilities in the Company’s consolidated balance sheets for the years ended December 31, 2009 and 2008. The changes in the product warranties for the years ended December 31, 2009 and 2008, are as follows:

(in  
thousands)  
Balance at \$ 135  
December 31,  
2007  
Provision 842  
charged to  
income  
Usage (482)  
Balance at 495  
December 31,  
2008  
Provision 848  
charged to  
income  
Usage (593)  
Balance at \$ 750  
December 31,  
2009

(1) Internal Research and Development Costs

Internal research and development costs are charged to operations as incurred. During the years ended December 31, 2009 and 2008, Company funded research and development costs were approximately \$1.1 million and \$803 thousand, respectively.



(m) Earnings (Loss) Per Share

Basic earnings (loss) per share is computed by dividing income available to common stockholders by the weighted average number of common shares outstanding during the period. Diluted earnings (loss) per share gives effect to all potential dilutive common shares outstanding during the period. The computation of diluted earnings (loss) per share does not assume conversion, exercise or contingent exercise of securities that would have an anti-dilutive effect on earnings (loss) per share. The Company did not pay any dividends in 2009 and 2008.

(n) Comprehensive Income (Loss)

Comprehensive income (loss) is comprised of net income (loss) and other comprehensive income (loss). Other comprehensive income (loss) includes certain changes in equity that are excluded from net income (loss). Other comprehensive income (loss) was comprised of an unrealized gain (loss) of available-for-sale investments of approximately \$659 thousand and \$(487) thousand during the years ended December 31, 2009 and 2008, respectively.

(o) Stock-Based Compensation

The Company accounts for its stock-based compensation plans in accordance with the fair value recognition provisions of ASC 718 Compensation—Stock Compensation. The Company uses the Black-Scholes option pricing model as its method for determining the fair value of stock option grants. ASC 718 requires the fair value of all share-based awards that are expected to vest to be recognized in the statements of operations over the service or vesting period of each award. The Company uses the straight-line method of attributing the value of stock-based compensation expense for all stock option grants over the requisite service period.

(p) Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities 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. The significant estimates included in the consolidated financial statements are those relating to revenue recognition, reserves for doubtful accounts and sales returns and allowances, reserves for excess and obsolete inventory, impairment of long-lived assets, stock-based compensation, income taxes, and warranty reserves. Actual results could differ from those estimates.

(q) Financial Instruments

Financial instruments of the Company consist of cash and cash equivalents, short-term investments, accounts receivable, available for sale marketable securities, accounts payable, equipment and revolving line of credit and capital leases. The carrying amounts of these financial instruments approximate their fair value.

(r) Shipping and Handling Costs

Shipping and handling costs are included in cost of goods sold.

(s) Foreign Currency

The Company sells almost exclusively in U.S. dollars, generally against an irrevocable confirmed letter of credit through a major United States bank. Accordingly, the Company is not directly affected by foreign exchange fluctuations on its current sales orders. However, fluctuations in foreign exchange rates have an effect on the

Company's customers' access to U.S. dollars and on the pricing competition on certain pieces of equipment that the Company sells in selected markets. In addition, purchases made and royalties received under the Company's Consortium Agreement with Nisshinbo are in Japanese yen. In addition, the Company received Japanese yen related to the termination of the Consortium Agreement in 2008. The Company does purchase pieces of equipment from European vendors; these commitments are occasionally denominated in Euros. The Company bears the risk of any currency fluctuations that may be associated with these commitments. The

Company attempts to hedge known transactions when possible to minimize foreign exchange risk. The hedging activities during 2009 and 2008 were not material at any point during those years. Foreign exchange loss included in other expense was \$258 thousand and \$430 thousand for the years ended December 31, 2009 and 2008, respectively.

(t) Equity Investment in Joint Venture

The Company accounts for its unconsolidated investment in joint venture, Gloria Spire Solar, LLC, in accordance with the provisions of ASC 323, Investments—Equity Method and Joint Ventures. Since the joint venture's inception, the Company has reported financial results of the joint venture one quarter in arrears. Due to the liquidation of the joint venture in the third quarter of 2009, the Company has recorded losses on the accompanying statements of operations for the year ended December 31, 2009 of \$938 thousand and an impairment charge of \$85 thousand to reduce the value of the investment to the value of the proceeds received in the third quarter of 2009. Losses for the year ended December 31, 2008 were \$807 thousand. See Note 16 to the consolidated financial statements.

(u) Segment Information

ASC 280, Segment Reporting, requires public entities to report certain information about operating segments. Based on the guidance provided in ASC 280, the Company has determined that its business is conducted in four reportable segments: solar, biomedical, optoelectronics and corporate.

(v) New Accounting Standards

Effective July 1, 2009, the Company adopted the Financial Accounting Standards Board ("FASB"), Accounting Standards Codification ("ASC or Codification") Generally Accepted Accounting Principles ("ASC 105-10"). The Codification, which was issued in June 2009, is the new source of authoritative U.S. GAAP for the Securities and Exchange Commission ("SEC") registrants. The Codification reorganizes current U.S. GAAP into a topical format that eliminates the previous U.S. GAAP hierarchy and establishes two levels of U.S. GAAP – authoritative and non-authoritative. The Codification superseded all existing non-SEC accounting and reporting standards upon its effective date and carries the same level of authority as pronouncements issued under the previous hierarchy of U.S. GAAP. The Company does not expect the adoption of the Codification to have a significant impact on the Company's consolidated financial statements.

In October 2009, the FASB issued an amendment to ASC 605, Revenue Recognition, on the subtopic 605-25, Multiple-Element Arrangements. The amendment impacts the determination of when the individual deliverables included in a multiple-element arrangement may be treated as separate units of accounting. Additionally, the amendment modifies the manner in which the transaction consideration is allocated across the separately identified deliverables by no longer permitting the residual method of allocating arrangement consideration. The amendment is effective for revenue arrangement entered or materially modified in fiscal years beginning on or after June 15, 2010, however early adoption is permitted. The Company does not expect these new standards to significantly impact its consolidated financial statements.

Effective July 1, 2009, the Company adopted ASC 855, Subsequent Events. The pronouncement establishes recognition and disclosure standards for events that occur after the balance sheet date but before the financial statements are issued or are available to be issued. This guidance is effective on a prospective basis for interim periods ending after June 15, 2009. The adoption of the pronouncement did not have a significant impact on the Company's consolidated financial statements.

In March 2008, the FASB issued an Accounting Standards Update to ASC 815, Derivatives and Hedging. The update to ASC 815 requires enhanced disclosures about an entity's derivative and hedging activities. Entities are required to provide enhanced disclosures about (a) how and why an entity uses derivative instruments, (b) how derivative

instruments and related hedged items are accounted for and its related interpretations, and (c) how derivative instruments and related hedged items affect an entity's financial position, financial performance, and cash flows. The update to ASC 815 encourages, but does not require, comparative disclosures for earlier periods at initial adoption. The adoption of the update to ASC 815 on January 1, 2009 did not have a material impact on the Company's financial position or results of operations.

## 3. Accounts Receivable/Advances on Contracts in Progress

Net accounts receivable, trade consists of the following at December 31:

| (in thousands)                        | 2009      | 2008      |
|---------------------------------------|-----------|-----------|
| Amounts billed                        | \$ 5,625  | \$ 6,711  |
| Accrued revenue                       | 746       | 1,790     |
|                                       | 6,371     | 8,501     |
| Less: Allowance for doubtful accounts | (481 )    | (403 )    |
| Net accounts receivable - trade       | \$ 5,890  | \$ 8,098  |
| Advances on contracts in progress     | \$ 21,712 | \$ 35,658 |

Accrued revenue represents revenues recognized on contracts for which billings have not been presented to customers as of the balance sheet date. These amounts are billed and generally collected within one year.

The Company maintains allowances for doubtful accounts for estimated losses resulting from the inability of its customers to pay amounts due. The Company actively pursues collection of past due receivables as the circumstances warrant. Customers are contacted to determine the status of payment and senior accounting and operations management are included in these efforts as is deemed necessary. A specific reserve will be established for past due accounts when it is probable that a loss has been incurred and the Company can reasonably estimate the amount of the loss. The Company does not record an allowance for government receivables and invoices backed by letters of credit as realizeability is reasonably assured. Bad debts are written off against the allowance when identified. There is no dollar threshold for account balance write-offs. While rare, a write-off is only recorded when all efforts to collect the receivable have been exhausted.

Advances on contracts in progress represent contracts for which billings have been presented to the customer, either as deposits or progress payments against future shipments, but revenue has not been recognized.

## 4. Inventories and Deferred Cost of Goods Sold

Inventories, net of \$420 thousand and \$154 thousand of reserves at December 31, 2009 and 2008, respectively, and deferred cost of goods sold consist of the following at December 31:

| (in thousands)              | 2009      | 2008      |
|-----------------------------|-----------|-----------|
| Raw materials               | \$ 2,390  | \$ 3,517  |
| Work in process             | 8,170     | 7,385     |
| Finished goods              | 9,929     | 5,953     |
| Net inventory               | \$ 20,489 | \$ 16,855 |
| Deferred cost of goods sold | \$ 6,588  | \$ 17,088 |

The Company wrote-off \$215 thousand and \$268 thousand of excess and obsolete inventory for the years ended December 31, 2009 and 2008, respectively.

Deferred cost of goods sold represents costs of equipment that has shipped to the customer and title has passed. The Company defers these costs until the related revenue is recognized.

## 5. Property and Equipment

Property and equipment consists of the following at December 31:

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| (in thousands)                            | 2009      | 2008      |
|---|-----------|-----------|
| Machinery and equipment                   | \$ 18,244 | 17,947    |
| Furniture fixtures and computer equipment | 4,765     | 4,390     |
| Leasehold improvements                    | 3,484     | 3,299     |
| Construction in progress                  | 240       | 338       |
|   | 26,733    | 25,974    |
| Accumulated depreciation and amortization | (21,369 ) | (19,899 ) |
|   | \$ 5,364  | \$ 6,075  |

Depreciation and amortization expense relating to property and equipment was approximately \$1.5 million and \$1.8 million for the years ended December 31, 2009 and 2008, respectively.

#### 6. Accrued Liabilities

Accrued liabilities include the following at December 31:

| (in thousands)                    | 2009     | 2008     |
|-----------------------------------|----------|----------|
| Accrued payroll and payroll taxes | \$ 963   | \$ 1,718 |
| Accrued professional fees         | 222      | 396      |
| Accrued accounts payable          | 3,144    | 4,219    |
| Accrued other                     | 2,904    | 1,817    |
|                                   | \$ 7,233 | \$ 8,150 |

#### 7. Notes Payable and Credit Arrangements

On May 25, 2007, the Company entered into a Loan and Security Agreement (the "Equipment Credit Facility") with Silicon Valley Bank (the "Bank"). Under the Equipment Credit Facility, for a one-year period, the Company could borrow up to \$3.5 million in the aggregate to finance certain equipment purchases (including reimbursement of certain previously-made purchases). Advances made under the Equipment Credit Facility would bear interest at the Bank's prime rate, as determined, plus 0.5% and payable in thirty-six (36) consecutive monthly payments following the funding date of that advance. The Equipment Credit Facility, if not sooner terminated in accordance with its terms, expires on June 1, 2010.

On March 31, 2008, the Company entered into a second Loan and Security Agreement (the "Revolving Credit Facility") with the Bank. Under the terms of the Revolving Credit Facility, the Bank agreed to provide the Company with a credit line up to \$5 million.

On May 13, 2008, the Bank amended the Equipment Credit Facility and the Revolving Credit Facility, modifying the Company's net income profitability covenant requirements in exchange for a three quarters percent (0.75%) increase in the Company's interest rate and waiver restructuring fee equal to one half percent (0.5%) of amounts outstanding under the Equipment Credit Facility and committed under the Revolving Credit Facility. In addition, the Company's Equipment Credit Facility balance was to be factored in when calculating the Company's borrowing base under the Revolving Credit Facility.

On March 31, 2009, the Bank extended the expiration of the Revolving Credit Facility under the same terms in order to allow both parties the time to negotiate an expansion of the credit limit contingent upon the Company qualifying for an Export-Import Bank loan guarantee.

On June 22, 2009, the Company entered into two separate credit facilities with the Bank providing for credit lines of up to \$8 million in the aggregate: (i) an Amended and Restated Loan and Security Agreement (the “Restated Revolving Credit Facility”) pursuant to which the Bank agreed to provide the Company with a credit line of up to \$3 million and (ii) an Export-Import Bank Loan and Security Agreement (the “Ex-Im Facility”) pursuant to which the Bank agreed to provide the Company with a credit line of up to \$5 million to be guaranteed by the Export-Import Bank of the United States (the “EXIM Bank”). The Company’s obligations under these two credit facilities were secured by substantially all of the assets of the Company.

In addition, under the Restated Revolving Credit Facility, the Company’s existing Equipment Credit Facility with the Bank was amended whereby the Bank and the Company agreed that there would be no additional availability under such facility and, based on an outstanding principal amount of \$1.2 million on June 22, 2009, the Company would continue to make monthly installments of principal of \$97 thousand plus accrued interest until the outstanding balance was paid in full (the “Equipment Term Loan”).

The Company was not in compliance with its credit facilities tangible net worth covenant as of September 30, 2009, and was unlikely to be in compliance on a going forward basis. Accordingly, in November 2009, the Company entered into an agreement to amend and restate its two credit facilities to more closely match its business model and which contain a waiver of any prior financial covenant defaults.

On November 16, 2009, the Company entered into two separate amended and restated credit facilities with the Bank continuing to provide for credit lines of up to \$8 million in the aggregate: (i) a Second Amended and Restated Loan and Security Agreement (the “Second Restated Revolving Credit Facility”) pursuant to which the Bank agreed to continue to provide the Company with a credit line of up to \$3 million and (ii) an Amendment and Restated Export-Import Bank Loan and Security Agreement (the “Restated Ex-Im Facility”) pursuant to which the Bank agreed to continue to provide the Company with a credit line of up to \$5 million to be guaranteed by the EXIM Bank.

The Company’s obligations under these two amended credit facilities are secured by substantially all of the assets of the Company. Advances under the Second Restated Revolving Credit Facility are limited to 80% of eligible receivables. Interest on outstanding borrowings accrues at a rate per annum equal to the greater of (i) the prime rate plus 3.0% or (ii) 9.0% (9.0% as of December 31, 2009); with reductions in the rate if certain events occur, as defined. The Company’s obligations under the Restated Ex-Im Facility are secured by substantially all of the assets of the Company. Advances under the Restated Ex-Im Facility are limited to (i) 90% of eligible receivables subject to a suitable foreign currency hedge agreement if applicable, plus (ii) 75% of all other eligible receivables billed in foreign currency, plus (iii) the 50% of the value of eligible inventory, as defined. Interest on outstanding borrowings accrues at a rate per annum equal to the greater of (i) the prime rate plus 3.0% or (ii) 9.0% (9.0% as of December 31, 2009); with reductions in the rate if certain events occur, as defined.

In addition, under the Second Restated Revolving Credit Facility, with respect to the Company’s outstanding Equipment Term Loan with the Bank, the Company must continue to make monthly installments of principal of \$97 thousand plus accrued interest until the outstanding balance is paid in full. Interest on the Equipment Term Loan continues to accrue at a rate per annum equal to the greater of (i) the prime rate plus 1.75% or (ii) 7.75% (7.75% as of December 31, 2009).

Under the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility, as long as any commitment remains outstanding under the facilities, the Company must comply with a financial covenant by maintaining cash and availability line of \$1.0 million. In addition, until all amounts under the credit facilities with the Bank are repaid, covenants under the credit facilities impose restrictions on the Company’s ability to, among other things, incur additional indebtedness, create or permit liens on the Company’s assets, merge, consolidate or dispose of assets (other than in the ordinary course of business), make dividend and other restricted payments, make certain debt or equity



investments, make certain acquisitions, engage in certain transactions with affiliates or change the business conducted by the Company. Any failure by the Company to comply with the covenants and obligations under the credit facilities could result in an event of default, in which case the Bank may be entitled to declare all amounts owed to be due and payable immediately. The maturity date for each of these facilities is May 31, 2010.

The Equipment Term Loan's principal balance outstanding was \$583 thousand and \$1.8 million at December 31, 2009 and 2008, respectively. Advances outstanding under our Second Restated Revolving Credit Facility was \$1.0 million and \$1.5 million at December 31, 2009 and 2008, respectively. Advances outstanding under the Restated Ex-Im Facility as of December 31, 2009 were \$339.6 thousand. Availability under the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility was \$210 thousand and \$935 thousand, respectively, as of December 31, 2009.

#### 8. Stock-Based Compensation

At December 31, 2009, the Company had outstanding options under two stock option plans: the 1996 Equity Incentive Plan (the "1996 Plan") and the 2007 Stock Equity Plan (the "2007 Plan"). Both plans were approved by stockholders and provided that the Board of Directors may grant options to purchase the Company's common stock to key employees and directors of the Company. Incentive and non-qualified options must be granted at least at the fair market value of the common stock or, in the case of certain optionees, at 110% of such fair market value at the time of grant. The options may be exercised, subject to certain vesting requirements, for periods up to ten years from the date of issue. The 1996 Plan expired with respect to the issuance of new grants as of December 10, 2006. Accordingly, future grants may be made only under the 2007 Plan.

At December 31, 2009, the Company has outstanding under its 1996 Plan and 2007 Plan, an aggregate 163,746 non-qualified stock options held by the unaffiliated directors of the Company for the purchase of common stock at an average exercise price of \$8.14 per share.

| A summary of the activity of this plan follows:         | Number of<br>Shares | Weighted<br>Average<br>Exercise<br>Price |
|---|---------------------|--|
| Options Outstanding at December 31, 2008                | 606,177             | \$ 7.52                                  |
| Granted   | 195,000             | \$ 5.80                                  |
| Exercised   | (4,000 )            | \$ 1.78                                  |
| Forfeited   | (15,500 )           | \$ 8.60                                  |
| Options Outstanding at December 31, 2009                | 781,677             | \$ 7.10                                  |
| Expected to Vest at December 31, 2009                   | 291,495             | \$ 7.44                                  |
| Options Exercisable at December 31, 2009                | 473,022             | \$ 6.87                                  |
| Options Available for Future Grant at December 31, 2009 | 521,800             |  |

In accordance with ASC 718, the Company has recognized stock-based compensation expense of approximately \$585 thousand and \$754 thousand for the years ended December 31, 2009 and 2008, respectively. Approximately \$425 thousand and \$574 thousand of stock-based compensation expense was charged to selling, general and administrative expenses for the years ended December 31, 2009 and 2008, respectively and approximately \$160 thousand and \$180 thousand of stock-based compensation expense was charged to cost of sales for the years ended December 31, 2009 and 2008, respectively. No stock-based compensation expense was capitalized during 2009 and 2008 because it was immaterial. Compensation expense related to stock options to be charged in future periods amounts to approximately \$1.1 million at December 31, 2009 and will be recognized over a weighted-average period of 2.53 years as follows:

Expected

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| For the<br>years<br>ended<br>December<br>31, | Compensation<br>Expense |
|--|-------------------------|
|  | (in thousands)          |
| 2010   | \$ 522                  |
| 2011   | 346                     |
| 2012   | 207                     |
| 2013   | 52                      |
|  | \$1,127                 |

ASC 718 requires forfeitures to be estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates in order to derive the Company's best estimate of awards ultimately expected to vest. Forfeitures represent only the unvested portion of a surrendered option and are typically estimated based on historical experience.

The options outstanding and exercisable at December 31, 2009 were in the following exercise price ranges:

| Range of Exercise Price | Number of Shares Outstanding | Options Outstanding                                 |                                 |                           | Options Exercisable          |   |                                 |                           |
|-------------------------|------------------------------|---|---------------------------------|---------------------------|------------------------------|---|---------------------------------|---------------------------|
|                         |                              | Weighted Average Remaining Contractual Life (Years) | Weighted-Average Exercise Price | Aggregate Intrinsic Value | Number of Shares Exercisable | Weighted Average Remaining Contractual Life (Years) | Weighted Average Exercise Price | Aggregate Intrinsic Value |
| \$2.50 to \$ 3.90       | 103,911                      | 3.63  | \$ 3.78                         | \$ 164,000                | 93,911                       | 3.04  | \$ 3.81                         | \$ 146,000                |
| \$3.91 to \$ 4.90       | 126,319                      | 5.25  | \$ 4.37                         | 125,000                   | 126,319                      | 5.25  | \$ 4.37                         | 125,000                   |
| \$4.91 to \$ 8.40       | 327,122                      | 8.38  | \$ 6.63                         | —                         | 117,942                      | 7.25  | \$ 7.22                         | —                         |
| \$8.41 to \$ 9.60       | 123,700                      | 7.49  | \$ 9.39                         | —                         | 71,850                       | 7.49  | \$ 9.39                         | —                         |
| \$9.61 to \$15.73       | 100,625                      | 8.15  | \$ 12.68                        | —                         | 63,000                       | 8.03  | \$ 12.95                        | —                         |
|                         | 781,677                      | 7.07  | \$ 7.10                         | \$ 289,000                | 473,022                      | 6.02  | \$ 6.87                         | \$ 271,000                |

The aggregate intrinsic value in the table above represents the total intrinsic value, based on the Company's closing stock price of \$5.36 as of December 31, 2009, which would have been received by the option holders had all option holders exercised their options as of that date. The total intrinsic value of options exercised was approximately \$13 thousand and \$111 thousand for the years ended December 31, 2009 and 2008, respectively. The total intrinsic value of options expected to vest at December 31, 2009 was approximately \$19 thousand, and the weighted average remaining contractual life of outstanding options that are expected to continue to vest is 8.25 years.

The per-share weighted-average fair value of stock options granted was \$3.43 and \$5.19 for the years ended December 31, 2009 and 2008, respectively, on the date of grant using the Black-Scholes option-pricing model with the following weighted-average assumptions:

| Year | Expected Dividend Yield | Risk-Free Interest Rate | Expected Option Life | Expected Volatility Factor |
|------|-------------------------|-------------------------|----------------------|----------------------------|
| 2008 | —                       | 2.11%                   | 4.5 years            | 73.7%                      |
| 2009 | —                       | 1.67%                   | 4.13 years           | 79.6%                      |

The risk free interest rate reflects treasury yields rates over a term that approximates the expected option life. The expected option life is calculated based on historical lives of all options issued under the plan. The expected volatility factor is determined by measuring the actual stock price volatility over a term equal to the expected useful life of the options granted.

## 9. Income Taxes

There was a net income tax provision of \$13 thousand and \$270 thousand for the year ended December 31, 2009 and 2008, respectively. The Company recognized a \$2.2 million tax benefit related to income from continuing operations, which was offset by a corresponding \$2.2 million income tax expense associated with the sale of the Company's Medical Products Business Unit during the year ended December 31, 2009. This income tax expense was recorded in discontinued operations.

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The reconciliation between the amount computed by applying the United States federal statutory tax rate of 34% to pretax income (loss) and the actual provision for income taxes follows:

| (in thousands)  | 2009        | 2008     |
|---|-------------|----------|
| Income tax provision (benefit) – continuing operations at statutory rate    | \$ (3,708 ) | \$ 1,745 |
| Increase (decrease) in valuation allowance related to<br>income tax expense | 1,183       | (1,833 ) |
| State income taxes  | 49          | 46       |
| Permanent differences   | 235         | 312      |
| Income tax provision (benefit) – continuing operations                      | (2,241 )    | 270      |
| Income tax provision – discontinued operations at statutory rate            | 1,916       | —        |
| State income taxes – discontinued operations                                | 338         | —        |
| Income tax provision – discontinued operations                              | 2,254       | —        |
| Total   | \$ 13       | \$ 270   |

The tax effects of temporary differences that give rise to significant portions of deferred tax assets and deferred tax liabilities are as follows:

| (in thousands)                               | 2009   | 2008   |
|--|--------|--------|
| Deferred tax assets:                         |        |        |
| Accounts receivable                          | \$ 192 | \$ 215 |
| Accruals                                     | 3,749  | 3,716  |
| Inventories                                  | 303    | 177    |
| Net operating loss carryforwards             | 2,507  | 1,375  |
| General business credit carryforwards        | 113    | 26     |
| Alternative minimum tax credit carryforwards | 431    | 468    |
| Foreign tax credit                           | 38     | 57     |
| Total gross deferred tax assets              | 7,333  | 6,034  |
| Equity investment in joint venture           | —      | 476    |
| Depreciation                                 | 963    | 528    |
| Total gross deferred tax liabilities         | 963    | 1,004  |
| Valuation allowance                          | 6,370  | 5,030  |
| Net deferred tax assets                      | \$ —   | \$ —   |

The net change in the total valuation allowance for the period ended December 31, 2009 was an increase of \$1.3 million. Gross federal net operating loss carryforwards were approximately \$7.8 million as of December 31, 2009 and expire at various times through 2029. Included in this amount was approximately \$3.5 million attributable to equity based compensation transactions. Approximately \$1.0 million of the valuation allowance will be relieved through equity if these deductions for equity based transactions are realized. Under Section 382 of the Internal Revenue Code, certain substantial changes in the Company's ownership may limit the amount of net operating loss carryforwards that can be utilized in any one year to offset future taxable income.

At December 31, 2009, the Company does not have any uncertain tax positions, unrecognized tax benefits and did not recognize any interest or penalties. The Company does not expect there to be a change in unrecognized tax benefits over the next twelve months.

## 10. Commitments

### Letters of Credit

Outstanding letters of credit totaled \$1.5 million and \$4.2 million at December 31, 2009 and 2008, respectively. The letters of credit principally secure performance obligations, and allow holders to draw funds up to the face amount of the letter of credit if the Company does not perform as contractually required. These letters of credit expire through 2010 and are 100% secured by cash, restricted cash and the Second Restated Revolving Credit Facility.

### Property Under Capital Leases and Lease Commitments

At December 31, 2009 and 2008, the Company had operating and capital leases for office space and office equipment.

At December 31, 2009, future minimum lease payments for the period ended are as follows:

| (in thousands)               | Unrelated<br>Party<br>Operating<br>Leases | Related Party<br>Operating<br>Leases | Unrelated<br>Party Capital<br>Leases |
|------------------------------|---|--------------------------------------|--------------------------------------|
| 2010                         | \$ 178                                    | \$ 3,243                             | \$ 54                                |
| 2011                         | 82  | 3,419                                | 54                                   |
| 2012                         | 60  | 3,399                                | 41                                   |
| 2013                         | 35  | 1,418                                | 15                                   |
| 2014                         | —   | 1,485                                | 9                                    |
| 5 years and thereafter       | —   | 1,020                                | —                                    |
| Total minimum lease payments | \$ 355                                    | \$ 13,984                            | \$ 173                               |

The Related Party Capital Lease (described below) and three month extension with SPI-Trust expired in August 2008. On August 29, 2008, the Company and SPI-Trust entered in a new seven-year lease that the Company determined qualifies as a related party operating lease based on the terms of the lease agreement. Accordingly, the asset and accumulated depreciation were removed from the balance sheet. See “Related Party Operating Lease” below.

#### Related Party Capital Lease

In May 2003, Spire Semiconductor leased a building (90,000 square feet) in Hudson, New Hampshire from SPI-Trust whereby Spire Semiconductor agreed to pay \$4.1 million to SPI-Trust over an initial five-year term expiring in May 2008 with a Company option to extend for five years. The lease agreement did not provide for a transfer of ownership at any point. Interest costs were assumed at 7%. Interest expense was approximately \$8,000 the year ended December 31, 2008. This lease was classified as a related party capital lease.

Upon the expiration of the lease in May 2008, The Company did not exercise its option to extend the lease for an additional 5 years. On May 20, 2008, the Company agreed with SPI-Trust to continue the current lease, under the current terms and conditions on a month-to-month basis for a maximum of three (3) months beyond the current term which ended on August 31, 2008. On August 29, 2008, the Company and SPI-Trust entered in a new seven-year lease that the Company determined qualifies as a related party operating lease. See “Related Party Operating Lease” below.

#### Unrelated Party Capital Lease

In August 2009 the Company entered into a lease for information technology storage equipment whereby the Company agreed to pay \$73 thousand over a five year term expiring in July 2014. The lease agreement did not provide for a transfer of ownership at any point. Interest costs were assumed at 11%. Interest expense was approximately \$2,000 the year ended December 31, 2009. This lease was classified as a unrelated party capital lease.

In September 2009 the Company entered into a lease for information technology storage equipment whereby the Company agreed to pay \$120 thousand over a three year term expiring in August 2012. The lease agreement did not provide for a transfer of ownership at any point. Interest costs were assumed at 13%. Interest expense was approximately \$4,000 the year ended December 31, 2009. This lease was classified as a unrelated party capital lease.

The asset value of the equipment under capital lease is \$154 thousand and is recorded in property and equipment in the Company’s consolidated balance sheet for the year ended December 31, 2009.

#### Unrelated Party Operating Leases

Unrelated party operating leases primarily consist of leases for copiers and the telephone system.

Related Party Operating Lease

On November 30, 2007, the Company entered into a new Lease Agreement (the "Bedford Lease") with SPI-Trust, with respect to 144,230 square feet of space comprising the entire building in which the Company has occupied space since December 1, 1985. The term of the Bedford Lease commenced on December 1, 2007 and continues for five (5) years until November 30, 2012. The Company has the right to extend the term of the Bedford Lease for an additional five (5) year



period. The annual rental rate for the first year of the Lease is \$12.50 per square foot on a triple net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. The annual rental rate increases on each anniversary by \$0.75 per square foot. If the Company exercises its right to extend the term of the Bedford Lease, the annual rental rate for the first year of the extended term will be the greater of (a) the rental rate in effect immediately preceding the commencement of the extended term or (b) the market rate at such time, and on each anniversary of the commencement of the extended term the rental rate will increase by \$0.75 per square foot. The Company believes that the terms of the Bedford Lease are commercially reasonable. Rent expense under the Bedford Lease was \$2.0 million for the year ended December 31, 2009 and 2008.

On August 29, 2008, the Company entered into a new Lease Agreement (the "Hudson Lease") with SPI-Trust, with respect to 90 thousand square feet of space comprising the entire building in which Spire Semiconductor has occupied space since June 1, 2003. The term of the Hudson Lease commenced on September 1, 2008, and continues for seven (7) years until August 31, 2015. The Company has the right to extend the term of the Hudson Lease for an additional five (5) year period. The annual rental rate for the first year of the Hudson Lease is \$12.50 per square foot on a triple-net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. The annual rental rate increases on each anniversary by \$0.75 per square foot. If the Company exercises its right to extend the term of the Hudson Lease, the annual rental rate for the first year of the extended term will be the greater of: (a) the rental rate in effect immediately preceding the commencement of the extended term; or (b) the market rate at such time, and on each anniversary of the commencement of the extended term the rental rate will increase by \$0.75 per square foot. In addition, the Company is required to deposit with SPI-Trust \$300 thousand as security for performance by the Company for its covenants and obligations under the Hudson Lease. SPI-Trust is responsible, at its sole expense, to make certain defined tenant improvements to the building. The Company believes that the terms of the Hudson Lease are commercially reasonable and reflective of market rates. The lease agreement does not provide for a transfer of ownership at any point. The Hudson Lease is classified as a related party operating lease. Rent expense under the Hudson Lease was \$1.3 million and \$443 thousand for the year ended December 31, 2009 and 2008, respectively.

## 11. Employee Benefit Plans

### Profit Sharing Plan

In 1985, the Company adopted a profit sharing plan under Section 401(k) of the Internal Revenue Code. This plan allows employees to defer up to 17.5% of their income up to certain dollar limits on a pretax basis through contributions to the plan. The Company began discretionary matching contributions starting September 2008. The Company's matching contributions were approximately \$195 thousand and \$60 thousand for the year ended December 31, 2009 and 2008, respectively.

### Deferred Compensation Plan

Effective January 1, 2002, the Company adopted the Spire Corporation Non-Qualified Deferred Compensation Plan (the "Plan") for Roger Little, Chairman of the Board, Chief Executive Officer and President of the Company (the "Participant"). Under this Plan, the Company makes equal monthly contributions to the Spire Corporation Non-Qualified Deferred Compensation Trust (the "Trust") up to the annually required amount of \$250 thousand. The Company records these contributions as selling, general and administrative expense when made. The Trustee makes all investment decisions for the Trust on behalf of the Participant. The Company has not guaranteed a return on investment for the Participant, however, all earnings and losses on the Plan assets are borne by the Participant. All contributions and earnings are fully vested to the Participant when made but are subject to the Company's creditors in the event of bankruptcy. As a result, the assets held in the Plan have been recorded as available-for-sale investments in the consolidated balance sheet with a corresponding liability being recorded as deferred compensation. Unrealized gains and losses on the available-for-sale investments are recorded as accumulated other comprehensive income

within the equity section of the consolidated balance sheet. A corresponding entry to deferred compensation is made to increase (decrease) the amounts due the Participant resulting from the changes in the asset value with an offsetting charge or credit to selling, general and administrative expense. Compensation expense was approximately \$257 thousand and \$250 thousand in the years ended December 31, 2009 and 2008, respectively. Accrued compensation expense related to the Plan was \$229 thousand at December 31, 2009 and there was no accrued balance at December 31, 2008.

## 12. Earnings (Loss) Per Share

The following table provides a reconciliation of the denominators of the Company's reported basic and diluted earnings (loss) per share computations for the years ended December 31:

|  | 2009      | 2008      |
|--|-----------|-----------|
| Weighted average number of common and common equivalent shares outstanding – basic   | 8,334,304 | 8,328,592 |
| Add: Net additional common shares upon assumed exercise of common stock options      |           | — 136,031 |
| Weighted average number of common and common equivalent shares outstanding – diluted | 8,334,304 | 8,464,623 |

For the years ended December 31, 2009 and 2008, 46,260 and 206,825 shares of common stock, respectively, issuable relative to stock options were excluded from the calculation of diluted shares because their inclusion would have been anti-dilutive.

In addition, for the years ended December 31, 2009 and 2008, 551,447 and 64,500 shares of common stock, respectively, issuable relative to stock options were excluded from the calculation of diluted shares because their inclusion would have been anti-dilutive, due to their exercise prices exceeding the average market price of the stock for the period.

## 13. Legal Matters

From time to time, the Company is subject to legal proceedings and claims arising from the conduct of its business operations.

The Company is not aware of any current or pending legal proceedings to which it is or may be a party that it believes could materially adversely affect its results of operations or financial condition or cash flows.

## 14. Operating Segments and Related Information

The following table presents certain operating division information in accordance with the provisions of ASC 280, Segment Reporting.

| (in thousands)                | Spire Solar | Spire Biomedical | Optoelectronics | Corporate | Total Company |
|-------------------------------|-------------|------------------|-----------------|-----------|---------------|
| December 31, 2009             |             |                  |                 |           |               |
| Net sales and revenues        | \$57,822    | \$9,148          | \$ 2,901        | \$—       | \$69,871      |
| Income (loss) from operations | (9,097 )    | 1,119            | (1,362 )        | —         | (9,340 )      |
| Identifiable assets           | 32,854      | 2,688            | 3,654           | 14,076    | 53,272        |
| Capital expenditures          | 104         | 6                | 317             | 195       | 622           |
| Depreciation and amortization | 345         | 178              | 667             | 329       | 1,519         |
| Stock-based compensation      | 219         | 71               | 39              | 256       | 585           |
|                               | Spire Solar | Spire Biomedical | Optoelectronics | Corporate | Total Company |

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December 31, 2008

|                               |          |         |          |        |          |
|-------------------------------|----------|---------|----------|--------|----------|
| Net sales and revenues        | \$51,901 | \$7,955 | \$ 5,108 | \$—    | \$64,964 |
| Income (loss) from operations | 10,353   | (395 )  | (2,784 ) | —      | 7,174    |
| Identifiable assets           | 45,209   | 2,338   | 3,962    | 14,407 | 65,916   |
| Capital expenditures          | 689      | 49      | 183      | 789    | 1,710    |
| Depreciation and amortization | 268      | 200     | 1,198    | 184    | 1,850    |
| Stock-based compensation      | 193      | 98      | 95       | 368    | 754      |

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The following table shows net sales and revenues by geographic area (based on customer location) for the years ended December 31:

| (in thousands)    | 2009      | %     | 2008      | %     |
|-------------------|-----------|-------|-----------|-------|
| United States     | \$ 28,798 | 41 %  | \$ 27,804 | 43 %  |
| Europe/N. Africa  | 15,191    | 22 %  | 14,089    | 22 %  |
| Asia              | 25,561    | 37 %  | 22,782    | 35 %  |
| Rest of the world | 321       | —     | 289       | —     |
|                   | \$ 69,871 | 100 % | \$ 64,964 | 100 % |

The Company's operations are focused on three primary business areas: Spire Solar (comprised of solar equipment, solar systems and solar materials), Spire Biomedical (comprised of biomedical and biophotonics research) and optoelectronics (comprised primarily of Spire Semiconductor). Spire Solar and Spire Biomedical operate out of the Company's facility in Bedford, Massachusetts. Spire Semiconductor operates out of the Company's facility in Hudson, New Hampshire. Each business area is independently managed and has separate financial results that are reviewed by the Board of Directors and Chief Executive Officer and the chief executive officers of each operating division.

On December 14, 2009, the Company completed the sale the Medical Products Business Unit to Bard Access Systems, Inc. Accordingly, the results and assets of the Medical Products Business Unit are being presented herein as discontinued operations and assets held for sale. See Note 17.

Income (loss) from operations is net sales less cost of sales, selling, general and administrative expenses, gain on sales of asset and gain on termination of contract, but is not affected either by non-operating income (expense) or by income taxes. In calculating income from operations for individual business units, substantial administrative expenses incurred at the operating level that are common to more than one segment are allocated on a net sales basis. Certain corporate expenses of an operational nature are also allocated to the divisions based on factors including occupancy, employment, and purchasing volume. All intercompany transactions have been eliminated.

Revenues from contracts with United States government agencies for 2009 and 2008 were approximately \$16.1 million and \$1.7 million, or 23% and 3% of consolidated net sales and revenues, respectively.

Revenues from the delivery of a solar equipment cell line and a solar equipment module line to two different customers account for 17% and 15%, respectively, of total net sales and revenue for 2009 and recurring revenue from the sale of solar cell materials to another customer accounted for 18% of total net sales and revenue during the same period. The Company did not have any customers that accounted for more than 10% of consolidated net sales and revenues in 2008.

One customer represented approximately 24% of net accounts receivable, trade at December 31, 2009 and two customers represented approximately 14% and 12% of net accounts receivable, trade at December 31, 2008.

Korea and Portugal were the only foreign countries that accounted for more than 10% of sales in 2009 and Spain and India were the only foreign countries that accounted for more than 10% of sales in 2008. Net sales to customers in Korea and Portugal accounted for \$16.9 million and \$10.8 million, respectively, in 2009 and net sales to customers in Spain and India accounted for \$9.2 million and \$8.6 million, respectively, in 2008.

#### 15. Gain on Termination of Contracts

On September 1, 2008, Nisshinbo Industries, Inc. delivered a letter to the Company stating its intention to terminate the global Consortium Agreement ("Consortium Agreement") entered into between Nisshinbo and the Company on May 16, 2005, relating to the development, manufacturing and sale of photovoltaic module manufacturing equipment. In

accordance with the Consortium Agreement, Nisshinbo provided its 180 day prior notice to terminate the Consortium Agreement effective as of February 28, 2009. However, on November 28, 2008, the Company signed a Separation and Novation Agreement (the "Separation Agreement") with Nisshinbo that, among other things, accelerated the termination of the Consortium Agreement and the payment by Nisshinbo to the Company of an early termination penalty. Under the Separation Agreement, the termination of the Consortium Agreement was effective as of November 30, 2008.

Under the terms of the Consortium Agreement and the Separation Agreement, as a result of early termination by Nisshinbo for convenience, the Company received a termination penalty payment of \$6.8 million in December 2008. In addition, the Company received a final royalty payment of approximately \$659 thousand from Nisshinbo for outstanding equipment being built by Nisshinbo for its customer base. The Company granted Nisshinbo a perpetual, royalty-free, non-

exclusive, non-sub-licensable (for four years) license to the Company's existing solar photovoltaic module manufacturing equipment methods of engineering, designing, manufacturing and other related methods that were in effect when the Company entered into the Consortium Agreement in 2005. Both parties declined technology licenses for technology developed by the other party during the term of the Consortium Agreement. Nisshinbo will continue to manufacture certain products for the Company on a non-exclusive basis.

On August 29, 2008, the Company delivered to Principia Lightworks, Inc. ("Principia") a Notice of Breach and Pending Termination of a certain Manufacturing Agreement, dated August 29, 2006, by and between Spire Semiconductor and Principia (the "Manufacturing Agreement"). Under the terms of the Manufacturing Agreement, Principia made an up-front payment for nonrecurring engineering and facility access costs and was required to make monthly facility availability payments throughout the term of the agreement. As a result of Principia's failure to make monthly facility availability payments in 2008, the Company has fully reserved \$225 thousand against Principia's accounts receivable balance. The Company entered into a mutual standstill agreement with Principia, which expired on March 15, 2009. The purpose of the standstill was to give the parties additional time to negotiate a resolution.

On March 27, 2009, Spire Semiconductor and Principia mutually agreed to terminate the Manufacturing Agreement for convenience and entered into a separation and novation agreement (the "Novation Agreement"). Under the terms of the Novation Agreement, both parties agreed to terminate technology licenses that were granted to each other under the terms of the Manufacturing Agreement and Spire Semiconductor was released from its production requirements to Principia. Principia was released from paying its future facility availability payments due under the Manufacturing Agreement but will be required to pay facility availability payments of \$300 thousand. Spire Semiconductor holds 67,500 shares of Principia stock as collateral against the outstanding facility availability payments. During the three months ended March 31, 2009, the Company accelerated the amortization of deferred revenue and recognized \$1.54 million as a gain on termination of contracts related to the termination of the Manufacturing Agreement.

On June 18, 2009, the Company entered into a settlement agreement with Marubeni Corporation with respect to the License to Manufacture and Distribute Equipment Agreement (the "License Agreement") dated April 1, 2003 for the license of manufacturing and distribution in Japan of the Company's solar photovoltaic modular manufacturing equipment. Under the terms of the settlement agreement, both parties agreed to terminate the License Agreement including but not limited to the eighteen month non-compete obligation. As a result of the settlement, the Company received a payment and recognized a gain on termination of contracts of \$200 thousand in the second quarter of 2009.

In the fourth quarter of 2009, the Company determined that three purchase and sale agreements with Jiangxi Gemei Sci-Tech., LLC ("Jiangxi") related to a module equipment line and cell equipment line were terminated due to a breach of contract by Jiangxi. Jiangxi had failed to make payments as required by the agreements and has not responded to numerous communications by the Company. The Company made commitments to purchase equipment on behalf of Jiangxi and due to Jiangxi not making contractual payments, the Company entered into settlement agreements with these vendors. As a result of deposits paid by Jiangxi less settlements paid to vendors and inventory written off, the Company recognized a gain on termination of contracts of \$1.4 million.

#### 16. Liquidation of Joint Venture

In July 2007, the Company entered into a joint venture with Gloria Solar Co., Ltd. and related entities ("Gloria Solar"), a leading cell and module manufacturer in Taiwan, which designs, sells and manages installations of photovoltaic systems. The Company's 45% ownership stake in the joint venture, Gloria Spire Solar, LLC (the "Joint Venture"), was obtained through the contribution of the Company's building integrated photovoltaic business to Gloria Solar. Gloria Solar owns the remaining 55% of the Joint Venture. The Joint Venture was formed for the purpose of pursuing the solar photovoltaic systems market within the United States. On June 3, 2009, the Company entered into a Liquidation Agreement, as amended (the "Liquidation Agreement"), with Gloria Solar pursuant to which the parties agreed to liquidate the Joint Venture. Under the terms of the Liquidation Agreement, the parties agreed to a specified allocation

of the remaining assets of the Joint Venture after all liabilities have been paid, with each party receiving a share of project leads, intellectual property and remaining cash. The Company will assume responsibility for supporting the Joint Venture's existing client base, including the remaining warranties. As a result of the liquidation, the Company has formed Spire Solar Systems as a full-service organization, offering system designs and project management to domestic markets.

Since the Joint Venture's inception, the Company has reported financial results of the Joint Venture one quarter in arrears. Due to the liquidation of the Joint Venture in the third quarter of 2009, the Company has recorded losses on the accompanying statement of operations for the year ended December 31, 2009



of \$938 thousand and an impairment charge of \$85 thousand to reduce the value of the investment to the value of the proceeds received. The Company received \$450 thousand in cash from the liquidation of the Joint Venture in the third quarter of 2009. Losses for the year ended December 31, 2008 were \$807 thousand.

#### 17. Discontinued Operations and Assets Held for Sale

In accordance with ASC 205-20, Presentation of Financial Statements – Discontinued Operations, the accompanying consolidated balance sheets, statements of operations and cash flows present the results and assets of the Medical Products Business Unit as discontinued operations and assets held for sale. During the second quarter of 2009, the Company began pursuing an exclusive sales process of the Medical Products Business Unit. The Company (i) determined that the Medical Products Business Unit was a separate component of the Company's business as, historically, management reviewed separately the Medical Products Business Unit's financial results apart from the Company's ongoing continuing operations, (ii) eliminated the Medical Products Business Unit's financial results from ongoing operations and (iii) determined that the Company will have no further continuing involvement in the operations of the Medical Products Business Unit or cash flows from the Medical Products Business Unit after the sale.

On December 14, 2009, the Company completed the sale of the Medical Products Business Unit to Bard Access Systems, Inc. The maximum purchase price payable for the Medical Products Business Unit is \$12.5 million, including (i) \$9.4 million that was paid to the Company at closing, (ii) \$100 thousand that was paid at closing to two of the Company's employees, including Mark Little, Chief Executive Officer of Spire Biomedical, as consideration for their execution of non-competition agreements, and (iii) \$3.0 million payable based on the achievement of certain milestones described below (the "Contingent Purchase Price").

Certain of the assets were transferred to Bard at the closing, and certain other assets (the "Contingent Deferred Assets") will be transferred to Bard upon the completion of a product recall related to such assets, which is expected to occur in the second quarter of 2010. Until the Contingent Deferred Assets are transferred by the Company, it will continue to manufacture and supply to Bard certain hemodialysis catheter products under the terms of a distribution agreement (the "Transition Period"). Upon the transfer of the Contingent Deferred Assets to Bard, Bard will pay \$1.5 million of the Contingent Purchase Price to the Company. Bard will pay up to \$1.5 million of the remaining Contingent Purchase Price to the Company based upon the achievement of milestones related to the manufacture and supply of certain quantities of hemodialysis catheter products under the distribution agreement. The transfer price for hemodialysis catheter products delivered to Bard under the distribution agreement will be equal to our standard costs of goods, including related overhead, without mark-up and calculated in accordance with U.S. generally accepted accounting principles.

The Company initiated a voluntary recall of certain catheters based upon three field complaints of catheter malfunctions received in the third quarter of 2009. No patient injury or complications resulted from the malfunction. It was determined that under certain molding conditions, there was a possibility that insufficient bonding may occur which could cause the catheter to malfunction. As it could not be isolated to a particular lot, the Company initiated a voluntary recall of any inventory held by our distributors and their customers. As the manufacturer of record the Company is responsible for ensuring that the product meets the product specifications and the associated product liability that may result in failure those specifications. Included in discontinued operations are reserves for inventory and potential returns related to a voluntary recall of medical products totaling approximately \$1.1 million in the year ended December 31, 2009. Not included in discontinued operations are certain indirect costs of the Medical Products Business Unit that have been reclassified to selling, general and administrative expense of \$584 thousand and \$541 thousand for the years ended December 31, 2009 and 2008, respectively. The voluntary recall was initiated in October 2009 and in February 2010 the Company determined that it had achieved a 100% effectiveness rating based upon the recall criteria and have submitted a request to the U.S. Food and Drug Administration requesting to close the recall action. This request is currently pending.

The Company recorded a gain on sale of business unit of \$7.7 million for the year ended December 31, 2009. Included in the gain is proceeds received from Bard of \$9.4 million, less inventory transferred to Bard of \$610 thousand, less patents transferred to Bard of \$301 thousand and less legal, professional and other fees related to complete the sale of \$748 thousand

Spire Biomedical warrants that any of its catheter products found to be defective will be replaced. No warranty is made that the failure of the product will not occur, and Spire disclaims any responsibility for any medical complications. Spire Biomedical warrants that its services only will meet the agreed upon specifications.

The assets and liabilities of the Medical Products Business Unit as of December 31, 2009 and 2008 are as follows:

| (in thousands)   | December<br>31, 2009 | December<br>31, 2008 |
|--|----------------------|----------------------|
| Assets of Discontinued Operations and Assets Held for Sale               |                      |                      |
| Current assets of discontinued operations and assets held for sale       |                      |                      |
| Accounts receivable – trade, net   | \$104                | \$775                |
| Inventories, net   | 50                   | 1,021                |
| Deposits on equipment for inventory                                      | —                    | 14                   |
| Prepaid expenses and other current assets                                | —                    | 44                   |
| Total current assets of discontinued operations and assets held for sale | 154                  | 1,854                |
| Property and equipment, net  | 9                    | 14                   |
| Intangible and other assets, net   | 49                   | 366                  |
| Total assets of discontinued operations and assets held for sale         | \$212                | \$2,234              |
| Liabilities of Discontinued Operations                                   |                      |                      |
| Current liabilities of discontinued operations                           |                      |                      |
| Accounts payable   | \$593                | \$319                |
| Accrued liabilities  | 1,089                | 554                  |
| Total current liabilities of discontinued operations                     | 1,682                | 873                  |
| Total liabilities of discontinued operations                             | \$1,682              | \$873                |

Condensed results of operations relating to the Medical Products Business Unit are as follows:

| (in thousands)   | Year Ended December 31, |           |
|--|-------------------------|-----------|
|  | 2009                    | 2008      |
| Net sales and revenues   | \$ 2,387                | \$ 3,688  |
| Gross margin   | \$ 363                  | \$ 1,316  |
| Loss from discontinued operations before sale of business unit | \$ (2,105 )             | \$ (680 ) |
| Gain on sale of business unit                                  | 7,741                   | —         |
| Income tax provision   | (2,254 )                | —         |
| Net income (loss) from discontinued operations, net of tax     | \$ 3,382                | \$ (680 ) |

#### 18. Subsequent Events

The Company evaluated subsequent events through the date of this filing and had no subsequent events to report.

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

None.

#### Item 9A (T). Controls and Procedures

##### Management's Report on Internal Control over Financial Reporting

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

- pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company;
- 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 in accordance with authorizations of management and directors of the company; and
- 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 the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. 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.

Our management, under the supervision of and with the participation of the Chief Executive Officer, Chief Financial Officer and Chief Accounting Officer, assessed the effectiveness of our internal control over financial reporting as of December 31, 2009. In making this assessment, our management used the criteria set forth by the Committee of

Sponsoring Organizations (“COSO”) of the Treadway Commission in Internal Control - An Integrated Framework (September 1992). Because of the material weaknesses described below, management concluded that, as of December 31, 2009, our internal control over financial reporting was not effective.

Control environment

We did not maintain an effective control environment. The control environment, which is the responsibility of senior management, sets the tone of the organization, influences the control consciousness of its people, and is the foundation for all other components of internal control over financial reporting. Each of the following control environment material weaknesses also contributed to the material

weaknesses discussed in each of the items below. Our control environment was ineffective because of the following material weaknesses:

- We did not maintain a sufficient complement of personnel with an appropriate level of tax and accounting knowledge, experience, and training in the application of Generally Accepted Accounting Principles (“GAAP”) commensurate with our financial reporting requirements and business environment. This material weakness resulted in material post closing adjustments which have been reflected in the financial statements for the year ended December 31, 2009. These adjustments caused changes in current assets, property and equipment, current liabilities and expenses, specifically in inventory values and cost of sales.
- The financial reporting organization structure was not adequate to support the size, complexity or activities of our Company. Many of the processes are manual or some combination of automated-manual processes, tasks are repeated multiple times as there is not sufficient interface between some the applications of the Company and all of these combine with the insufficient complement of staff to ensure the timely preparation of financial statements in accordance with GAAP.

The control environment material weaknesses described above contributed to the material weaknesses related to our monitoring of internal control over financial reporting and period end financial close and reporting.

#### Monitoring of internal control over financial reporting

We did not maintain effective monitoring controls to determine the adequacy of our internal control over financial reporting and related policies and procedures because of the following material weaknesses:

- We did not maintain sufficient policies and procedures, with respect to the review, training, supervision and monitoring of our accounting operations throughout the organization, to effectively determine the adequacy of our internal control over financial reporting and to monitoring the ongoing effectiveness thereof.
- We did not maintain documentation or evidence of review for several controls involving monitoring of cash flows, reviews of financial statements and variance analysis prepared by different individuals.

Each of these material weaknesses relating to the monitoring of our internal control over financial reporting contributed to the material weaknesses described in below.

#### Period end financial close and reporting

Due to material weaknesses in the control environment described above,, we did not establish and maintain effective controls over certain of our period-end financial close and reporting processes because of the following material weaknesses:

- We were unable to adhere to the timeline established in the monthly and quarterly close checklist
- We did not maintain effective controls over the completeness and accuracy of supporting information for certain financial statement account reconciliations.
- We did not maintain effective controls to ensure proper valuation of inventory, cost of sales and pricing variances. Specifically, we did not have effective controls over the procedures to determine the appropriateness of standard costs and in identifying and valuing excess and obsolete inventories.
  - We do not have an effective risk management policy for spreadsheets, critical and otherwise.
- Due to the limited number of individuals in the finance group that have significant tax experience, the deferred tax analysis and the related disclosures were not prepared timely at year end. Failure to do so could result in misstatement of the financial statements or the required disclosures.

- We did not maintain effective controls over our IT environment. Specifically, we did not perform a timely review of restricted user access in our general ledger application software system and document the meetings of the IT Steering Committee.

#### Changes in Internal Control Over Financial Reporting

As previously reported in Item 9A(T) of our Annual Reports on Form 10-K for the years ended December 31, 2008 and 2007 we reported material weaknesses in our internal control over financial reporting (as defined in Rule 13a-15(f) and 15d-15(f) under the Exchange Act). As a result of those material weaknesses in our internal control over financial reporting,

Management concluded that our internal controls over financial reporting were not effective as of December 31, 2008. Those material weaknesses included the following:

• Insufficient personnel with an appropriate level of technical accounting knowledge, experience, and training who could execute appropriate monitoring and review controls particularly in situations where transactions were complex or non-routine or required specific application of appropriate GAAP.

• Due to the limited number of people working in the accounting group that have significant tax experience, the deferred tax analysis and the related disclosures were not prepared timely at year end. Failure to do so could result in misstatement of the financial statements or the required disclosures.

• A timely review of restricted user access in our application software system was not completed and our defined back up polices and procedures were not consistently followed.

- Inadequate segregation of duties led to untimely identification and resolution of accounting and disclosure matters and failure to perform timely and effective supervision and reviews.

• Proper valuation of inventory and project cost variance review and analysis controls were not in place or ineffective.

During the quarter ended December 31, 2009, no changes other than those in conjunction with certain remediation efforts described below, were identified with respect to our internal control over financial reporting that materially affected, or were reasonably likely to materially affect, our internal control over financial reporting.

#### Remediation Plans

Management, in coordination with the input, oversight and support of our Audit Committee, has identified the following measures to strengthen our internal control over financial reporting and to address the material weaknesses described above.

- We hired a Corporate Controller during April of 2009, who was promoted to Chief Accounting Officer in October of 2009, who added accounting knowledge, experience and application of US GAAP.
- Prior to the filing of this Annual Report on Form 10-K, we hired a Corporate Controller to fill the position previously held by the Chief Accounting Officer, who will:
  - Prepare annual and quarterly consolidated financial statements
  - Prepare annual and quarterly account reconciliations
  - Prepare annual and quarterly journal entries
  - Improve the overall segregation of duties within the finance group
- Management is actively addressing operational and internal control remediation efforts. New policies and procedures have been created and existing policies and procedures will be reviewed and modified as part of our documentation of internal control over financial reporting. Management believes these new controls, policies and procedures, training of key personnel, and testing of these key controls will be effective in remediating these material weaknesses. Management reports quarterly to our Audit Committee on the status of the remediation effort.
- In connection with the findings of our review related to the November 2008 restatement of our previously issued financial statements for the fourth quarter and fiscal 2007 included in our Annual Report on Form 10-K for the fiscal year ended December 31, 2007 and our previously issued financial statements included in the Quarterly Report on Form 10-Q for the fiscal quarters ended March 31, 2008 and June 30, 2008, management and the Audit Committee reviewed the additional internal control procedures and processes that have been implemented since the original date of the error and have identified additional remediation steps to address the material weakness of untimely reporting of customer contract changes. We have implemented new internal controls and enhanced accounting policies, as well as improved sales policies and procedures relating to customer contract management and order fulfillment. These efforts will continue to be reviewed and improved upon as necessary.

We purchased a network upgrade and additional servers during June of 2009 to ensure the IT department has adequate tools necessary to mitigate an industry-standard set of risk statements following guidelines outlined in the Control Objectives for Information Technology (COBIT) promulgated jointly by the IT Governance Institute and the Information Systems Audit and Control Association (ISACA).

The additional staff has and will continue to assist us address the identified weakness in the knowledge and experience required for completeness and accuracy of our financial statements and also improve our overall financial close and reporting



process. The staff addition will also allow for proper segregation of duties within our financial department. Further, we have contracted with a Consultant to assist us in our Sarbanes-Oxley controls re-design, testing and remediation efforts.

While we expect these remedial actions to be essentially implemented in calendar year 2010, some may not be in place for a sufficient period of time to help us certify that material weaknesses have been fully remediated as of the end of calendar year 2010. We will continue to develop our remediation plans and implement additional measures during calendar year 2010 and possibly into calendar year 2011.

If the remedial measures described above are insufficient to address any of the identified material weaknesses or are not implemented effectively, or additional deficiencies arise in the future, material misstatements in our interim or annual financial statements may occur in the future. We are currently working to improve and simplify our internal processes and implement enhanced controls, as discussed above, to address the material weaknesses in our internal control over financial reporting and to remedy the ineffectiveness of our disclosure controls and procedures.

A key element of our remediation effort is the ability to recruit and retain qualified individuals to support our remediation efforts. While our Audit Committee and Board of Directors have been supportive of our efforts by supporting the hiring of various individuals in our finance department as well as funding efforts to improve our financial reporting system, improvement in internal control will be hampered if we can not recruit and retain more qualified professionals. Among other things, any unremediated material weaknesses could result in material post-closing adjustments in future financial statements. Furthermore, any such unremediated material weaknesses could have the effects described in "Item 1A. Risk Factors—In preparing our consolidated financial statements, we identified material weaknesses in our internal control over financial reporting, and our failure to effectively remedy the material weaknesses identified as of December 31, 2009 could result in material misstatements in our financial statements" in Part I of this Form 10-K.

#### Item 9B. Other Information

On March 26, 2010, Christian Dufresne notified us of his intention to resign as Chief Financial Officer and Treasurer of Spire Corporation so that he can pursue other opportunities. The effective date of his resignation has not yet been determined. Dr. Dufresne has agreed to continue in this role for a period of time in order to effectuate a smooth transition to his successor.

#### Uni-Chem Agreements

As previously disclosed, on August 26, 2009, we entered into a Purchase and Sale Agreement for 60MW Solar Cell Production Line (the "Cell Line Agreement") to provide Uni-CHEM Co., Ltd., a South Korean company ("Uni-Chem"), a 60 megawatt turn-key multi-crystalline cell manufacturing line (the "Cell Line") for \$21.75 million. The down payment under this agreement has not yet been fully received.

In addition, on August 26, 2009, we entered into a Purchase and Sale Agreement for 50MW Solar Module Production Line (the "Module Line Agreement") to provide Uni-Chem a 50 megawatt turn-key module manufacturing line (the "Module Line") for \$13.25 million. The down payment under this agreement has not yet been fully received.

Finally, concurrently with the execution of the Cell Line Agreement and the Module Line Agreement, we entered into a Project Management Agreement for Utilities & Infrastructure Supply for Spire Cell and Module Line (the "Project Management Agreement") under which we agreed to provide Uni-Chem with certain utilities and infrastructure support services for the Cell Line and the Module Line. The aggregate price for these services would be \$11.5 million, payable over time as these services are provided.

Under a Memorandum of Agreement, Uni-Chem was to make a \$2.0 million non-refundable deposit to us creditable towards the Module Line Agreement if Uni-Chem makes all initial down payments under the three projects noted above. Uni-Chem has paid \$1.0 million of this deposit and the parties signed amendments, which extended the next payment due on or before November 20, 2009. As of March 19, 2010, Uni-Chem has failed to make the remaining \$1.0 million deposit payment.

Uni-Chem has informed us that it is having difficulty in obtaining financing for the collective projects. They also stated that they may want to renegotiate the project scope. While the contracts have not been terminated, as of December 31, 2009, we have suspended work on the collective projects until Uni-Chem has demonstrated an ability to secure financing. As of March 30, 2010, Uni-Chem has failed to make the remaining \$1.0 million deposit payment under the Memorandum of Agreement or any other down payments due under the collective agreements.

### PART III

#### Item 10. Directors, Executive Officers and Corporate Governance

Information concerning our directors, executive officers and corporate governance is set forth in the Proxy Statement for the Special Meeting in Lieu of 2010 Annual Meeting of Stockholders (“Proxy Statement”) and is incorporated herein by reference. Information concerning compliance with Section 16(a) of the Exchange Act is set forth under “Compliance with Section 16(a) of the Securities Exchange Act of 1934” in the Proxy Statement and is incorporated herein by reference.

We have adopted a Code of Business Conduct and Ethics (the “Code”) that applies to our principal executive officer, principal financial officer and principal accounting officer or controller, as well as to directors, officers and employees generally. The Code sets forth written standards that are reasonably designed to deter wrongdoing and to promote (1) honest and ethical conduct, (2) full, fair, accurate, timely and understandable disclosure in reports and documents that we file with the SEC and in other public communications made by us, (3) compliance with applicable governmental laws, rules and regulations, (4) the prompt internal reporting of violations of the Code to an appropriate person or persons identified in the Code and (5) accountability for adherence to the Code. We will provide to any person without charge, upon request, a copy of the Code. Any person wishing a copy should write to Michael W. O’Dougherty, Clerk, Spire Corporation, One Patriots Park, Bedford, Massachusetts 01730-2396.

A copy of the Code is incorporated by reference as Exhibit 21 to our Form 10-KSB for the fiscal year ended December 31, 2003.

#### Item 11. Executive Compensation

Information concerning executive compensation is set forth in the Proxy Statement and is incorporated herein by reference.

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

Information concerning security ownership of certain beneficial owners and management, and related stockholder matters, is set forth in the Proxy Statement and is incorporated herein by reference.

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

Information concerning certain relationships and related transactions, and director independence, is set forth in the Proxy Statement and is incorporated herein by reference.

#### Item 14. Principal Accounting Fees and Services

Information concerning principal accounting fees and services is set forth in the Proxy Statement and incorporated herein by reference.

### PART IV

#### Item 15. Exhibits

The following Exhibits are either filed herewith or are incorporated by reference as may be indicated.

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- 2.1 Asset Purchase Agreement, dated as of July 31, 2007, by and between the Company and Gloria Solar Co., Ltd., incorporated by reference to Exhibit 2.1 to the Company's Form 8-K filed with the Securities and Exchange Commission (the "SEC") on September 10, 2007 \*+
- 2.2 Contribution Agreement, dated as of July 31, 2007, by and among the Company, Gloria Solar Co., Ltd. and Gloria Solar (Delaware) Company, Ltd., incorporated by reference to Exhibit 2.2 to the Company's Form 8-K filed with the SEC on September 10, 2007 \*+

- 2.3 Gloria Spire Solar LLC Liquidation Agreement, dated May 29, 2009, by and among Gloria Solar (Delaware) Company, Ltd., Gloria Solar Co., Ltd., Gloria Spire Solar, LLC and Spire Corporation, incorporated by reference to Exhibit 2.3 to the Company's 2009 Form 10-Q for the quarter ended June 30, 2009. +
- 2.4 First Amendment to the Gloria Spire Solar, LLC Liquidation Agreement, dated June 2, 2009, by and among Gloria Solar (Delaware) Company, Ltd., Gloria Solar Co., Ltd., Gloria Spire Solar, LLC and Spire Corporation, incorporated by reference to Exhibit 2.4 to the Company's 2009 Form 10-Q for the quarter ended June 30, 2009. +
- 2.5 Asset Purchase Agreement, dated September 4, 2009, by and among Bard Access Systems, Inc. and Spire Biomedical, Inc. and Spire Corporation, incorporated by reference to Exhibit 2.5 to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009+
- 2.6 Extension dated September 25, 2009 of Asset Purchase Agreement, dated September 4, 2009, by and among Bard Access Systems, Inc. and Spire Biomedical, Inc. and Spire Corporation, incorporated by reference to Exhibit 2.6 to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009
- 2.7 Extension dated October 30, 2009 of Asset Purchase Agreement, dated September 4, 2009, by and among Bard Access Systems, Inc. and Spire Biomedical, Inc. and Spire Corporation, incorporated by reference to Exhibit 2.7 to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009
- 2.8 Extension dated November 30, 2009 of Asset Purchase Agreement, dated September 4, 2009, by and among Bard Access Systems, Inc. and Spire Biomedical, Inc. and Spire Corporation, incorporated by reference to Exhibit 2.8 to the Company's Form 8-K filed with the SEC on December 18, 2009
- 2.9 Amendment dated December 14, 2009 of Asset Purchase Agreement, dated September 4, 2009, by and among Bard Access Systems, Inc. and Spire Biomedical, Inc. and Spire Corporation, incorporated by reference to Exhibit 2.9 to the Company's Form 8-K filed with the SEC on December 18, 2009+
- 3(a) Articles of Organization as amended, incorporated by reference to Exhibit 3(a) to the Company's Form 10-QSB for the quarter ended June 30, 1997
- 3(b) By-Laws, as amended, incorporated by reference to Exhibit 3(b) to the Company's Form 10-K for the year ended December 31, 1989
- 10(a) Sublease Agreement with Millipore Corporation as landlord for facility at Bedford, Massachusetts dated November 25, 1985, incorporated by reference to Exhibit 10(a) to the Company's Form 10-K for the year ended December 31, 1985
- 10(b) Amendment to Sublease Agreement with Millipore Corporation as landlord for facility at Bedford, Massachusetts dated December 30, 1999, incorporated by reference to Exhibit 10(b) to the Company's Form 10-KSB for the year ended December 31, 1999 ("1999 10-KSB")
- 10(c) Sublease Agreement with Methode Electronics, Inc. as tenant for a portion of the facility at Bedford, Massachusetts dated December 29, 1999, incorporated by reference to Exhibit 10(c) to the 1999 10-KSB
- 10(d) Asset Purchase Agreement dated as of November 18, 1999 with Methode Electronics, Inc. and Methode Massachusetts, Inc., incorporated by reference to Exhibit 1 to the Company's Form 8-K dated December 29, 1999

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10(e) Employment Agreement with Roger G. Little dated as of January 1, 2002, incorporated by reference to Exhibit 10(e) to the Company's Form 10-KSB for the year ended December 31, 2001 ("2001 10-KSB")

10(f) Deferred Compensation Plan with Roger G. Little dated as of January 1, 2002, incorporated by reference to Exhibit 10(f) to 2001 10-KSB

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- 10(g) Spire Corporation 1985 Incentive Stock Option Plan, incorporated by reference to Exhibit 10(d) to the Company's Form 10-K for the year ended December 31, 1984
- 10(h) Spire Corporation 401(k) Profit Sharing Plan, incorporated by reference to Exhibit 10(h) to the Company's Form 10-KSB for the year ended December 31, 2003 ("2003 10-KSB")
- 10(i) Spire Corporation 1996 Equity Incentive Plan, incorporated by reference to Appendix A to the Company's Proxy Statement dated April 15, 2004
- 10(j) Purchase Agreement dated May 23, 2003 with Stratos Lightwave and Bandwidth Semiconductor, LLC, incorporated by reference to Exhibit 10(h) to the Company's Form 10-QSB for the quarter ended June 30, 2003
- 10(k) Lease Agreement dated May 23, 2003 by and between Roger G. Little, Trustee of SPI-Trust as Landlord and Spire Corporation as Tenant, incorporated by reference to Exhibit 10(i) to the Company's Form 10-QSB for the quarter ended June 30, 2003
- 10(l) Trust Agreement dated April 1, 2004 between the Company and Riggs Bank N.A. as Trustee of the Company's 401(k) Profit Sharing Plan, incorporated by reference to Exhibit 10(1) to the Company's Form 10-KSB for the year ended December 31, 2004 ("2004 10-KSB")
- 10(m) Amendment No. One dated November 18, 2004 to Employment Agreement for Roger G. Little, incorporated by reference to Exhibit 10(m) to the Company's 2004 Form 10-KSB
- 10(n) Development, Manufacturing, and Sales Consortium Agreement between Nisshinbo Industries, Inc. and Spire Corporation, with an effective date of 16 May 2005, incorporated by reference to Exhibit 10(n) to the Company's Form 10-QSB for the quarter ended June 30, 2005\*
- 10(o) Extension of Lease Agreement dated November 11, 2005 between Roger G. Little, Trustee of SPI-Trust and Spire Corporation (lease of premises, 77,037 sq. ft.), incorporated by reference to Exhibit 10(o) to the Company's 2005 Form 10-KSB
- 10(p) Amendment Number Four to the Spire Corporation 401(k) Profit Sharing Plan dated November 21, 2005, incorporated by reference to Exhibit 10(p) to the Company's 2005 Form 10-KSB
- 10(q) Turn-Key Project Agreement, dated March 16, 2006, incorporated by reference to Exhibit 10(s) to the Company's 2006 10-QSB for the quarter ended March 31, 2006 \*
- 10(r) Wafer Supply Agreement, dated March 16, 2006, incorporated by reference to Exhibit 10(r) to the Company's 2006 Form 10-QSB for the quarter ended March 31, 2006 \*
- 10(s) Manufacturing Agreement, dated August 29, 2006, by and between Bandwidth Semiconductor, LLC, a wholly owned subsidiary of Spire and Principia Lightworks, Inc., incorporated by reference to Exhibit 10(s) to the Company's 2006 Form 10-QSB for the quarter ended September 30, 2006 \*
- 10(t) First Amendment to Extension of Lease Agreement dated December 1, 2006 between Roger G. Little, Trustee of SPI-Trust and Spire Corporation (lease of premises, approximately 91,701 sq. ft.), incorporated by reference to Exhibit 10(t) to the Company's 2006 Form 10-KSB
- 10(u) Amendment Number Five to the Spire Corporation 401(k) Profit Sharing Plan dated December 22, 2006, incorporated by reference to Exhibit 10(u) to the Company's 2006 Form 10-KSB

10(v) Spire Corporation 2007 Stock Equity Plan, incorporated by reference to Exhibit 4.1 to the Company's Form S-8 filed with the Securities and Exchange Commission on June 5, 2007

10(w) Loan and Security Agreement, dated May 25, 2007, among Spire Corporation, Bandwidth Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(w) to the Company's 2007 Form 10-Q for the quarter ended June 30, 2007



- 10(x) Operating Agreement of Gloria Spire Solar, LLC, dated July 31, 2007, by and among the Company, Gloria Solar (Delaware) Company, Ltd. and Gloria Spire Solar, LLC, incorporated by reference to Exhibit 10(x) to the Company's Form 8-K filed with the SEC on September 10, 2007 \*
- 10(y) Lease Agreement, dated November 30, 2007, between Roger G. Little, Trustee of SPI-Trust, and Spire Corporation (lease of premises, approximately 144,230 sq. ft.), incorporated by reference to Exhibit 10(y) to the Company's Form 8-K filed with the SEC on December 6, 2007
- 10(z) Amended and Restated Deferred Compensation Plan with Roger G. Little dated as of January 1, 2005, incorporated by reference to Exhibit 10(z) to the Company's 2008 Form 10-Q for the quarter ended March 31, 2008.
- 10(aa) First Loan Modification Agreement, dated March 31, 2008, to the Loan and Security Agreement, dated May 25, 2007, among Spire Corporation, Bandwidth Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(aa) to the Company's 2008 Form 10-Q for the quarter ended March 31, 2008.
- 10(ab) Loan and Security Agreement, dated March 31, 2008, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(ab) to the Company's 2008 Form 10-Q for the quarter ended March 31, 2008.
- 10(ac) Second Loan Modification Agreement, dated May 13, 2008, to the Loan and Security Agreement, dated May 25, 2007, among Spire Corporation, Bandwidth Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(ac) to the Company's 2008 Form 10-Q for the quarter ended June 30, 2008.
- 10(ad) Waiver and First Loan Modification Agreement, dated May 13, 2008, to Loan and Security Agreement, dated March 31, 2008, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(ad) to the Company's 2008 Form 10-Q for the quarter ended June 30, 2008.
- 10(ae) Lease Agreement, dated September 1, 2008, between Roger G. Little, Trustee of SPI-Trust, and Spire Corporation, incorporated by reference to Exhibit 10(ae) to the Company's Form 8-K filed with the SEC on August 29, 2008.
- 10(af) Amended and Restated Loan and Security Agreement, dated June 22, 2009, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(af) to the Company's 2009 Form 10-Q for the quarter ended June 30, 2009.
- 10(ag) Export-Import Bank Loan and Security Agreement, dated June 22, 2009, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(ag) to the Company's 2009 Form 10-Q for the quarter ended June 30, 2009.
- 10(ah) Waiver Agreement, dated August 13, 2009, related to the Amended and Restated Loan and Security Agreement, dated June 22, 2009, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(ah) to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009.
- 10(ai) Purchase and Sale Agreement for 60MW Solar Cell Production Line, dated August 26, 2009, by and between Spire Corporation and Uni-CHEM Co., Ltd., incorporated by reference to Exhibit 10(ai) to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009. \*

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10(aj) Purchase and Sale Agreement for 50MW Solar Module Production Line, dated August 26, 2009, by and between Spire Corporation and Uni-CHEM Co., Ltd., incorporated by reference to Exhibit 10(aj) to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009. \*

10(ak) Project Management Agreement for Utilities & Infrastructure Supply for Spire Cell and Module Line, dated August 26, 2009, by and between Spire Corporation and Uni-CHEM Co., Ltd., incorporated by reference to Exhibit 10(ak) to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009. \*

- 10(al) Memorandum of Agreement, dated August 26, 2009, between Spire Corporation and Uni-CHEM Co., Ltd., incorporated by reference to Exhibit 10(al) to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009.
- 10(am) Amendment No. 1 to Purchase and Sale Agreement for 60MW Solar Cell Production Line, dated September 17, 2009, between Spire Corporation and Uni-CHEM Co., Ltd., incorporated by reference to Exhibit 10(am) to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009.
- 10(an) Amendment No. 1 to Purchase and Sale Agreement for 50MW Solar Module Production Line, dated September 17, 2009, between Spire Corporation and Uni-CHEM Co., Ltd., incorporated by reference to Exhibit 10(an) to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009.
- 10(ao) Amendment No. 1 to Memorandum of Agreement, dated September 17, 2009, between Spire Corporation and Uni-CHEM Co., Ltd., incorporated by reference to Exhibit 10(ao) to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009.
- 10(ap) Solicitation/Contract/Order for Commercial Items, dated November 28, 2008, by and between Spire Corporation and Federal Prison Industries, UNICOR, incorporated by reference to Exhibit 10(ap) to the Company's 2008 Form 10-K/A for the year ended December 31, 2008. \*
- 10(aq) Amendment of Solicitation/Modification of Contract MOD01 to Solicitation/Contract/Order for Commercial Items, dated April 20, 2009, by and between Spire Corporation and Federal Prison Industries, UNICOR, incorporated by reference to Exhibit 10(aq) to the Company's 2008 Form 10-K/A for the year ended December 31, 2008. \*
- 10(ar) Amendment of Solicitation/Modification of Contract MOD02 to Solicitation/Contract/Order for Commercial Items, dated June 8, 2009, by and between Spire Corporation and Federal Prison Industries, UNICOR, incorporated by reference to Exhibit 10(ar) to the Company's 2008 Form 10-K/A for the year ended December 31, 2008. \*
- 10(as) Amendment of Solicitation/Modification of Contract MOD03 to Solicitation/Contract/Order for Commercial Items, dated September 8, 2009, by and between Spire Corporation and Federal Prison Industries, UNICOR, incorporated by reference to Exhibit 10(as) to the Company's 2009 2008 Form 10-K/A for the year ended December 31, 2008. \*
- 14 Code of Business Conduct and Ethics incorporated by reference to Exhibit 14 to the 2003 10-KSB
- 21 Subsidiaries of the Registrant, incorporated by reference to Exhibit 21 to the 2003 10-KSB
- 23 Consent of Independent Registered Public Accounting Firm (filed herewith)
- 31.1 Certification of the Chairman of the Board, Chief Executive Officer and President pursuant to §302 of the Sarbanes-Oxley Act of 2002 (filed herewith)
- 31.2 Certification of the Chief Financial Officer pursuant to §302 of the Sarbanes-Oxley Act of 2002 (filed herewith)
- 32.1 Certification of the Chairman of the Board, Chief Executive Officer and President pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002 (filed herewith)

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Certification of the Chief Financial Officer pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002 (filed herewith)

- Portions of this Exhibit have been omitted pursuant to a grant of confidential treatment.
- + We agree to furnish supplementally to the SEC a copy of any omitted schedule or exhibit to this agreement upon request by the SEC.

## SIGNATURES

In accordance with Section 13 or 15(d) of the Exchange Act, the registrant caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

## SPIRE CORPORATION

Date: March 31, 2010

By: /s/ Roger G. Little  
 Roger G. Little  
 Chairman of the Board, Chief  
 Executive Officer, and President

In accordance with 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.

| Signature  | Title   | Date           |
|--|---|----------------|
| /s/ Roger G. Little<br>Roger G. Little                 | Chairman of the Board, Chief<br>Executive<br>Officer and President<br>(Principal Executive Officer) | March 31, 2010 |
| /s/ Christian Dufresne<br>Christian Dufresne           | Chief Financial Officer and<br>Treasurer<br>(Principal Financial Officer)                           | March 31, 2010 |
| /s/ Robert Lieberman<br>Robert Lieberman               | Chief Accounting Officer and<br>Controller<br>(Principal Accounting Officer)                        | March 31, 2010 |
| /s/ Udo Henseler<br>Udo Henseler                       | Director  | March 31, 2010 |
| /s/ David R. Lipinski<br>David R. Lipinski             | Director  | March 31, 2010 |
| /s/ Mark C. Little<br>Mark C. Little                   | Chief Executive Officer, Spire<br>Biomedical<br>and Director  | March 31, 2010 |
| /s/ Michael J. Magliochetti<br>Michael J. Magliochetti | Director  | March 31, 2010 |
| /s/ Guy L. Mayer<br>Guy L. Mayer                       | Director  | March 31, 2010 |
| /s/ Roger W. Redmond<br>Roger W. Redmond               | Director  | March 31, 2010 |



EXHIBIT INDEX

| Exhibit | Description  |
|---------|--|
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