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SPIRE Corp
Form 10-K
March 15, 2012

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

S Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934
For the fiscal year ended December 31, 2011 or

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

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

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

Securities registered pursuant to Section 12(b) of the Act:
Title of Each Class
Common Stock, \$0.01 par value per share

Name of Each Exchange on Which Registered
The Nasdaq Capital 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 o No x

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 o No x

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes x No o

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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 Smaller reporting company

(Do not check if a 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 Stock Market on June 30, 2011: \$14,819,000

The number of shares of the registrant's common stock outstanding as of March 9, 2012 was 8,562,633.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive proxy statement for the Special Meeting in Lieu of 2012 Annual Meeting of Stockholders currently scheduled to be held on May 17, 2012, are incorporated by reference in Part III of this Form 10-K.

Spire Corporation
 Form 10-K
 For the Year Ended December 31, 2011

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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. Our common stock trades on the Nasdaq Capital 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 turn-key solutions for the solar industry, including individual pieces of manufacturing equipment and full turn-key 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 16 issued patents and 13 patents pending. This expertise has provided the platform for development of our manufacturing equipment and turn-key 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, Solaria Energia, Martifer Solar S.A. and LDK Solar.

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 turn-key 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 grid connected applications in the commercial markets. Our systems use commercially available modules, in some cases manufactured by our turn-key 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 well positioned to capitalize on the market's growth. Our total sales and revenues for 2011 decreased approximately 23% compared to 2010 was primarily attributable to a decrease of \$9.7 million in solar cell material revenues and a decrease of \$8.1 million in solar cell line revenues.

Our biomedical business provides value-added surface treatments to manufacturers of orthopedic and other medical devices that enhance the durability, antimicrobial 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.

Recent Development - Sale of Semiconductor Business

During the first quarter of 2012, we began pursuing an exclusive sales process of our semiconductor business and on March 9, 2012, we completed the sale of our semiconductor business, which provides semiconductor foundry services, operates a semiconductor foundry and fabrication facility and is engaged in the business of wafer epitaxy, foundry services, and device

fabrication for the defense, medical, telecommunications and consumer products markets (the “Semiconductor Business Unit”), to Masimo Corporation. The asset purchase agreement provided that the aggregate purchase price for the Semiconductor Business Unit was \$8.0 million plus the assumption of \$500 thousand in liabilities, with the cash portion of the purchase price being reduced by retained cash and liabilities assumed by Masimo in excess of \$500 thousand. As a result, on the closing date we received approximately \$7.2 million in cash (less the escrow described below) and Masimo assumed approximately \$1.2 million in liabilities. The purchase price is subject to post-closing adjustments based on the balance sheet of the business as of the closing date. Of the purchase price, approximately \$717 thousand was deposited into an indemnity escrow account for fifteen months to partially secure our obligations for any indemnity claims under the asset purchase agreement. In connection with this transaction, the lease for the premises in Hudson, New Hampshire where the Semiconductor Business Unit was located was terminated on March 9, 2012, and we were released from all future obligations under the lease as of such date. See Note 17 to the consolidated financial statements.

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 16 to the consolidated financial statements.

The purchase price for the Medical Products Business Unit was \$12.4 million, including (i) \$9.4 million paid in cash to us at closing, (ii) \$100 thousand that was paid in cash at closing to two of our key employees, including Mark Little, Chief Executive Officer of Spire Biomedical, as consideration for their execution of non-competition agreements, and (iii) \$2.9 million that was paid in cash to us in the second quarter of 2010 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”) were transferred to Bard upon the completion of a product recall related to such assets, which occurred during the second quarter of 2010. Until the Contingent Deferred Assets were transferred by us, we continued to manufacture and supply to Bard certain hemodialysis catheter products under the terms of a distribution agreement (the “Transition Period”). The Contingent Deferred Assets were transferred to Bard and Bard paid \$1.5 million of the Contingent Purchase Price to us in the second quarter of 2010. In addition, Bard paid \$1.4 million of the remaining Contingent Purchase Price to us in the second quarter of 2010 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 was 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. From 2009 to 2011 new photovoltaic installations tripled worldwide, from about 7.5 GW to almost 23.0 GW, and it is expected to double again by 2015. 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 photovoltaic 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 coupled with rapid expansion of photovoltaic utility markets.

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 80%, utilize crystalline silicon modules. Silicon modules are high efficiency and low cost and have demonstrated endurance required by systems providers.

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. Spire provides equipment for the final two steps in the manufacturing process: cell production and module assembly.

Products and Services

Our core business is in the solar market, where we provide individual pieces of manufacturing equipment, turn-key cell and module lines, cell supply, solar factory management services, and solar systems. Our solar business was responsible for 83% of our revenues in 2011. We also operate smaller businesses in the semiconductor and biomedical device markets, both of which were 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 includes:

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; and

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.

Many of our customers have been new entrants in the solar photovoltaic market. These entities are primarily local manufacturers that are encouraged to produce photovoltaic modules with the aid of government incentive programs. We offer a turn-key solution with enabling technology to allow these companies to quickly enter into the market, or to expand existing capacity. We also sell individual equipment primarily 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 turn-key solar cell and wafer lines to customers for vertical integration. A majority of the equipment used in these lines is purchased from third parties and we provide integration services along with 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.

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 16 to the consolidated financial statements.

Spire Semiconductor

As noted above, on March 9, 2012, we sold our Semiconductor Business Unit 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 and distributors to augment our sales efforts for our solar equipment, and (ii) proposals for sponsored research and development work are prepared by our on-staff 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 numerous other manufacturers and service providers in each of our product and service areas; many of which have greater resources and sales. Additionally, with respect to our competition, our products and services utilize alternative technologies. For example, our solar photovoltaic systems compete with other forms of renewable energy including 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, 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 multiple suppliers and we generally rely on more than one supplier for each item.

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 14 issued United States patents, 2 foreign patents and 13 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 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 2007. 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 contract funded by the United States government, and their percent of consolidated net sales and revenues were \$914 thousand or 1%, and \$3.1 million, or 4%, for the years ended December 31, 2011 and 2010, 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 \$1.0 million and \$1.3 million for the years ended December 31, 2011 and 2010, respectively.

Customers and Markets

Revenues from the delivery of solar equipment to Servo Dynamics Co., Ltd. and First Solar, Inc. accounted for 15% and 10%, respectively, of total net sales and revenues for 2011. Revenues from the delivery of a solar photovoltaic system to PPS Berkshire Solar LLC accounted for 13% of total net sales and revenues for 2011. Revenues from the delivery of solar equipment and revenues from the sale of solar cell materials to Federal Prison Industries, Inc. accounted for 1% and 12%, respectively, of total net sales and revenues for 2011. See "UNICOR Relationship" below.

Revenues from the delivery of a solar equipment cell line and solar equipment module line to Solaria Energia accounted for 10% and 5%, respectively, of total net sales and revenues for 2010. Revenues from the delivery of solar equipment and revenues from the sale of solar cell materials to Federal Prison Industries, Inc. accounted for 7% and 21%, respectively, of total net sales and revenues for 2010. See "UNICOR Relationship" below.

Our export sales, which accounted for 48% and 39% of net sales and revenues for 2011 and 2010, respectively, continue to constitute a significant portion of our net sales and revenues. Over 90% of export sales in 2011 and 2010 were to solar 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) | 2011 | % | 2010 | % | % |
|-------------------|----------|-----|------------|-----|---|
| United States | \$31,890 | 52 | % \$48,793 | 61 | % |
| Europe/N. Africa | 5,747 | 9 | % 14,763 | 19 | % |
| Asia | 21,774 | 35 | % 16,233 | 20 | % |
| Rest of the world | 2,147 | 4 | % 53 | — | % |
| | \$61,558 | 100 | % \$79,842 | 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. The parties amended the pricing and quantity to be delivered during the initial two year term six times resulting in an overall decrease in value of the Cell Materials Contract to \$36.2 million and extending definite delivery commitments into the first quarter of 2011. Delivery commenced in the first quarter of 2009 with approximately 34%, 46% and 20% of the amended Cell Materials Contract value delivered in 2009, 2010 and 2011, respectively. The last amendment modified the contract from a definite quantity to a indefinite delivery, indefinite quantity contract after the final 20% of definite delivery commitments were delivered in 2011. The amended Cell Materials Contract expired on December 31, 2011.

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 a Federal prison facility located in Oregon. We delivered the equipment for this line in the first two quarters of 2010 and completed installation in the second quarter of 2011.

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, 2011, we had approximately 173 employees, of whom 168 worked full time. Our year-end head count included 103 employees in manufacturing operations, 3 employees in research and development, and 67 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 continuing operations and we expect that our operating results will fluctuate in the future.

We have experienced losses from continuing operations in fiscal year 2011 and 2010. These losses have contributed to an accumulated deficit of approximately \$14.1 million as of December 31, 2011. 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:

- 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;

• 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 solar systems and need to raise capital or borrow money as they are not currently profitable. If capital and credit markets are again disrupted 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 fund 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 photovoltaic 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 supply chain.

An increased global supply of photovoltaic modules has caused and may continue to cause structural imbalances in which global photovoltaic module supply exceeds demand, which could have a material adverse effect on our business, financial condition and results of operations

Solar manufacturers have installed production capacity that significantly exceeded global photovoltaic module demand in 2011. We believe this structural imbalance between supply and demand (i.e., where production capacity significantly exceeds current global demand) could continue for the foreseeable future, and could effect demand for photovoltaic manufacturing equipment. If our competitors reduce photovoltaic manufacturing equipment pricing to levels near or below their manufacturing costs, or are able to operate at minimal or negative operating margins for sustained periods of time, or if demand for photovoltaic manufacturing equipment does not grow sufficiently, our business, financial condition and results of operations could be adversely affected.

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 recent reforms to 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 Engineering, Procurement and Construction ("EPC") 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.

Disruptions in the capital and credit markets, such as those that occurred in connection with the national and world-wide financial crisis of the late 2000s, could adversely affect our results of operations, cash flows and financial condition, or those of our customers or suppliers.

Disruptions in the capital and credit markets 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 products, and unfavorable sales and product mix may adversely affect our revenues, operating results and cash flows.

A significant portion of our net sales and revenues have historically been derived from sales of solar equipment module lines augmented by individual sales of simulators, assemblers, laminators and other module equipment which accounted for 56% and 42% of our net sales and revenues for 2011 and 2010, respectively. There can be no assurance that solar equipment module lines and individual equipment component sales will in fact increase or maintain their current level of sales. Circumstances that might have an effect on the sales pipeline and resulting levels of future sales of these products include factors beyond our control. Specifically, demand for solar products and the introduction of competing product offerings by other equipment manufacturers could have a material adverse affect on our business, financial condition, operating results, cash flow and future prospects.

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 delivery of solar equipment and revenues from the sale of solar cell materials to the same customer accounted for 1% and 12%, respectively, of total net sales and revenues for 2011. Revenues from the delivery of solar equipment to two different customers accounted for 15% and 10%, respectively, of total net sales and revenues for 2011. Revenues from the delivery of a solar photovoltaic system to a customer accounted for 13% of total net sales and revenues for 2011. Follow on orders from these customers would be subject to a competitive bid process.

Revenues from the delivery of a solar equipment module line and revenues from the sale of solar cell materials to the same customer accounted for 7% and 21%, respectively, of total net sales and revenues for 2010. Revenues from the delivery of a solar equipment cell line and solar equipment module line to another customer account for 10% and 5%, respectively, of total net sales

and revenues for 2010. Follow on orders from these customers would be subject to a competitive bid process.

Revenue recognition of solar cell materials, solar systems, turn-key module and cell lines may result in significant fluctuations in operating results in sequential reporting periods and year over year comparisons. While many of these sales of solar equipment and systems are non-recurring, we have had instances of recurring sales to such customers and may have them in the future. The contract related to sales of solar cell materials concluded in 2011 and any follow on orders from this customer would be subject to a competitive bid process. 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.

In order to mitigate potential exposure to risk associated with the collection of receivables, we often request that customers agree to pay an advance down payment upon execution of a purchase and sale agreement. The collection of these advances are critical to improving the cash flow. If however, customers do not accept contract terms that include the payment of advances, there may be a negative effect on our financial condition.

Certain critical raw materials and sub-components purchased within our equipment build are frequently procured from a single-source or from a limited number of third party suppliers within the supply chain. A vendor's inability to deliver on a timely basis could result in manufacturing delays and our capability to meet scheduled ship dates to our customers based upon contractual obligations without incurring additional production costs.

Our inability to procure the raw materials and sub-components based upon acceptable specifications and tolerances within required lead times could disrupt or impair our ability to manufacture our solar equipment or add increased costs to the manufacturing process. Certain critical raw materials and sub-components purchased within our equipment build are frequently procured from a single-source or from a limited number of third party suppliers. Accordingly, the inability of any of our key suppliers to deliver on a timely basis could disrupt our supply chain and adversely affect our operations. Furthermore, in certain instances several of our suppliers tend to be smaller companies that may not be able to maintain a required flow of materials should our volume requirements rapidly increase. Such conditions could find us unable to identify new suppliers able to meet our raw material specifications to be incorporated into our production process on commercially reasonable terms and in a timely manner.

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.

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 turn-key solutions for the solar industry, including individual pieces of manufacturing equipment and full turn-key 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 turn-key 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 14 United States patents, 2 foreign patents and have 13 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 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 48% in 2011) 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 but not limited to 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;
- Strengthening of the United States dollar may negatively impact our foreign customers ability to purchase our products and services.
- Trade barriers such as export requirements, tariffs, taxes and other restrictions and expenses, which could increase the prices of our products and make our product offering less competitive in some countries; 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.

Global nature of our revenue subjects us to the legal systems of the international countries in which we offer and sell our products.

We offer and sell our products internationally which accounted for 48% and 39% of net sales and revenue for 2011 and 2010, respectively. As such, we are or could become subject to the laws and regulations of the jurisdictions in which we conduct business. Laws and regulations include but are not limited to health and safety and environmental regulations, which are specific to the countries in which we sell our products. Accordingly we design our equipment to ensure their compliance with all applicable known standards. Continued compliance to satisfy ever changing legal and regulatory requirements, may cause us to incur additional costs leading to margin erosion. Accordingly, foreign laws and regulations which are applicable to us may have a material adverse effect on our business, financial condition, operating results, cash flow and future prospects.

As a result of the laws and regulations of the foreign jurisdictions in which we carry on business, we may experience difficulty in enforcing customer purchase and sale agreements or certain provisions included therein including but not limited to product warranty which is normally provided to our customers. The inability to enforce our contractual rights in foreign jurisdictions may have a material adverse effect on our business, financial condition, operating results, cash flow and future prospects.

The use of our medical related products (including our former catheter products), as well as our photovoltaic module manufacturing equipment, 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, in 2010 we concluded 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 recalled only unused inventory held by distributors and hospitals. Even though we have completed the sale of our catheter product line to Bard, we are still the manufacturer of record of catheters implanted in patients, we are still responsible for those devices that we manufactured and are still liable for any recalls of any of these devices in the future. 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 Capital Market, which would adversely affect the price and liquidity of our common stock.

Our stock is currently listed on the Nasdaq Capital Market. In order to maintain our listing on the Nasdaq Capital 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 \$2.5 million (Marketplace Rule 5550(b)(1)), bid price of at least \$1 and market value of the common stock held by non-affiliates of at least \$1 million (Marketplace Rule 5550(a));
- market value of listed securities of at least \$35 million (Marketplace Rule 5550(b)(2)), bid price of at least \$1 and market value of the common stock held by non-affiliates of at least \$1 million (Marketplace Rule 5550(a)); or
- net income from continuing operations of at least \$500 thousand for the most recently completed fiscal year or two of the three most recently completed fiscal years (Marketplace Rule 5550(b)(3)), bid price of at least \$1 and market value of the common stock held by non-affiliates of at least \$1 million (Marketplace Rule 5550(a)).

As of the filing date of this Annual Report on Form 10-K, we are meeting the continued listing requirements set forth in the first bullet point above, as we have stockholders' equity of at least \$2.5 million (\$8.7 million as of December 31, 2011), our closing bid price has been at least \$1 per share for the required time period and the market value of the common stock held by non-affiliates is greater than \$1 million (approximately \$7.4 million as of March 1, 2012).

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 Capital 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 Capital 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 significant influence by principal stockholder.

Roger G. Little, our founder, Chairman of the Board, Chief Executive Officer and President, controls approximately 25% 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 in recent years, 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 2011 and 2010 and this effort involved substantial time and expense. Based on our evaluation under the framework in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission, management of our Company concluded that our internal control over financial reporting was effective as of December 31, 2011. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

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. 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 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.

We recognize revenue in accordance with various complex accounting standards, and changes in circumstances or interpretations may lead to accounting adjustments.

Our revenue recognition policies involve application of various complex accounting standards, including accounting guidance associated with revenue arrangements with multiple deliverables. Our compliance with such accounting standards often involves management's judgment regarding whether the criteria set forth in the standards have been met such that we can recognize as revenue the amounts that we receive as payment for our products or services. We base our judgments on assumptions that we believe to be reasonable under the circumstances. However, these judgments, or the assumptions underlying them, may change over time. Changes in circumstances or third-party guidance could cause our judgement to change with respect to our interpretations of these complex standards, and transactions recorded, including revenue recognized, for one or more prior reporting periods, which could be adversely affected.

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 2017. We believe that our facilities are suitable for their present intended purposes and adequate for our current level of operations.

Prior to the sale of the Semiconductor Business Unit, we leased an approximately 90,000 square foot facility in Hudson, New Hampshire for the Semiconductor Business Unit. In connection with sale of this business, the lease was terminated on March 9, 2012 and we were released from all future obligations under the lease as of that date. See Note 17 to the consolidated financial statements.

Item 3. Legal Proceedings

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

On January 11, 2011, a civil complaint (the "Action") was filed in U.S. District Court in Massachusetts by Spire Biomedical, Inc., our wholly-owned subsidiary, against a contract manufacturer alleging breach of contract related to the manufacture of medical devices. On December 30, 2011, the Action was fully and finally settled between the parties. See Note 13 and Note 16 to the consolidated financial statements.

On February 4, 2011, Silicon International Ltd. ("SI") filed a complaint in Suffolk Superior Court in Massachusetts, and on February 11, 2011 served a summons, against us alleging breach of contract related to SI's activities acting as a former sales and service representative of ours within China. The complaint makes claims regarding amounts allegedly owed to SI by us, specifically with regard to allegedly owed commissions. SI is seeking an accounting for all

money allegedly owed to it, including double or triple damages. We filed our answer and counterclaims against SI on February 24, 2011, denying SI's allegations, and claiming that SI interfered in our business relationships and generally engaged in multiple breaches of contract against us. We are seeking double or triple damages.

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

Item 4. Mine Safety Disclosures

Not applicable

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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 Capital 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 |
|----------------|----------|---------|
| 2011 | | |
| First Quarter | \$6.14 | \$3.77 |
| Second Quarter | 4.64 | 1.87 |
| Third Quarter | 2.69 | 0.26 |
| Fourth Quarter | 1.77 | 0.46 |
| 2010 | | |
| First Quarter | \$5.92 | \$3.35 |
| Second Quarter | 4.59 | 3.00 |
| Third Quarter | 4.45 | 3.00 |
| Fourth Quarter | 6.76 | 3.01 |

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 1, 2012 was \$1.22 and on that date, there were 259 shareholders 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 2011 or 2010 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

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 and systems for the photovoltaic solar industry, (ii) biomedical and (iii) prior to the sale of the Semiconductor Business Unit, optoelectronics, generally bringing to bear expertise in materials technologies, surface science and thin films across all three

business areas, discussed below.

In the photovoltaic solar area, we develop, manufacture and market specialized equipment for the production of terrestrial photovoltaic modules from solar cells and provide photovoltaic systems for grid connected applications in the commercial markets. 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 Switzerland. Our flagship product is our Sun Simulator which tests module performance. Our other product offerings include turn-key module lines and to a lesser extent other individual equipment. To compete we offer other services such as training and assistance with module certification. We also provide turn-key services to our customers to backward integrate to solar cell manufacturing. At times, we supply materials such as solar cells to certain customers.

In the biomedical area, we provide 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 perform sponsored research programs into practical applications of advanced biomedical and biophotonic technologies.

With respect to optoelectronics, on March 9, 2012, we completed the sale of our Semiconductor Business Unit, which provides semiconductor foundry services, operates a semiconductor foundry and fabrication facility and provides services to the defense, medical, telecommunications and consumer products markets, to Masimo Corporation. See Note 17 to the consolidated financial statements.

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 of operations and liabilities of the Medical Products Business Unit are being presented herein as discontinued operations. See Note 16 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 our solar equipment line and delivery of solar systems. Export sales, which amounted to 48% and 39% of net sales and revenues for 2011 and 2010, respectively, 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 "Net income from discontinued operations, net of tax" below and Note 16 to the consolidated financial statements.

The following discussion of our results of continuing operations include the results related to the Semiconductor Business Unit, which was sold on March 9, 2012. See 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, | | | |
|---|-------------------------|----|------|----|
| | 2011 | | 2010 | |
| Net sales and revenues | 100 | % | 100 | % |
| Cost of sales and revenues | (80 |) | (82 |) |
| Gross margin | 20 | | 18 | |
| Selling, general and administrative expenses | (25 |) | (23 |) |
| Internal research and development expenses | (2 |) | (2 |) |
| Gain on termination of contracts | 1 | | 2 | |
| Operating loss from continuing operations | (6 |) | (5 |) |
| Other expense, net | — | | — | |
| Loss from continuing operations before income tax benefit | (6 |) | (5 |) |
| Income tax benefit - continuing operations | 2 | | 2 | |
| Net loss from continuing operations | (4 |) | (3 |) |
| Net income from discontinued operations, net of tax | 2 | | 2 | |
| Net loss | (2 |)% | (1 |)% |

Overall

Our total net sales and revenues for the year ended December 31, 2011 (“2011”) decreased 23% to \$61.6 million as compared to \$79.8 million for the year ended December 31, 2010 (“2010”). The decrease was primarily attributable to a \$15.9 million decrease in solar revenue, a \$1.8 million decrease in optoelectronics revenue and a decrease of \$556 thousand in biomedical revenue.

Solar Business Unit

Sales in our solar business unit decreased 24% to \$51.0 million in 2011 as compared to \$66.9 million in 2010. The decrease is the result of a solar cell line completed during 2010 and a decrease in solar cell materials in 2011, partially offset by an increase in solar module equipment and solar system sales in 2011.

Biomedical Business Unit

Revenues in our biomedical business unit decreased 7% to \$7.8 million in 2011 as compared to \$8.3 million in 2010. The decrease was primarily attributable to a decrease in revenue from our research and development contracts.

Optoelectronics Business Unit

Sales in our optoelectronics business unit decreased 39% in 2011 to \$2.8 million as compared to \$4.6 million in 2010. The decrease was primarily attributable to decreased revenue with respect to the completion of a large government cost share contract in the third quarter of 2010.

Year Ended December 31, 2011 Compared to Year Ended December 31, 2010

Net Sales and Revenues

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

| (in thousands) | Year Ended December 31, | | Decrease | |
|--|-------------------------|----------|------------|-------|
| | 2011 | 2010 | \$ | % |
| Sales of goods | \$50,744 | \$66,736 | \$(15,992) | (24)% |
| Contract research and service revenues | 10,814 | 13,106 | (2,292) | (17)% |
| Net sales and revenues | \$61,558 | \$79,842 | \$(18,284) | (23)% |

The 24% decrease in sales of goods for 2011 as compared to 2010 was primarily attributable to a decrease of \$9.7 million in solar cell material revenues, a decrease of \$8.1 million in solar cell line revenues, partially offset by an increase of \$872 thousand in solar module manufacturing equipment revenues and an increase of \$656 thousand in solar system revenues. The decrease in sales of solar cell materials, all to one customer, of 58% in 2011 as compared to 2010 was primarily due to the completion of definite delivery commitments to a solar cell materials contract in the first quarter of 2011. The decrease in sales of solar cell line equipment of 100% in 2011 as compared to 2010 was primarily due to the completion of a solar cell line to one customer in 2010 as compared to none in 2011. The increase in solar module equipment sales of 3% in 2011 as compared to 2010 was primarily due to sales from an increase in individual module equipment units delivered in 2011, partially offset by a decrease in module manufacturing line revenue in 2011. The increase in sales of solar systems of 8% in 2011 as compared to 2010 was primarily due to the completion of larger photovoltaic system project in 2011.

The 17% decrease in contract research and service revenues for 2011 as compared to 2010 was primarily attributable to a decrease of \$1.8 million in optoelectronics service revenue and a decrease of \$556 thousand in biomedical revenue. Revenue from our optoelectronics processing services decreased 39% in 2011 compared to 2010 as a result of decreased revenue due to the completion of a government cost share contract in the third quarter of 2010. Revenues from our biomedical services decreased 7% in 2011 compared to 2010 as a result of a slight decrease in the number and value of biomedical orders in 2011 along with revenue recognized on a large funded research project in the fourth quarter of 2010.

Revenues from the delivery of solar equipment and revenues from the sale of solar cell materials to Federal Prison Industries, Inc. accounted for 1% and 12%, respectively, of total net sales and revenues for 2011. Revenues from the delivery of solar equipment to Servo Dynamics Co., Ltd. and First Solar, Inc. accounted for 15% and 10%, respectively, of total net sales and revenues for 2011. Revenues from the delivery of a solar photovoltaic system to PPS Berkshire Solar LLC accounted for 13% of total net sales and revenues for 2011.

Revenues from the delivery of solar equipment and revenues from the sale of solar cell materials to Federal Prison Industries, Inc. accounted for 7% and 21%, respectively, of total net sales and revenues for 2010. Revenues from the delivery of a solar equipment cell line and solar equipment module line to Solaria Energia accounted for 10% and 5%, respectively, of total net sales and revenues for 2010.

Cost of Sales and Revenues

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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, | | | | Decrease | |
|--|--------------------------|----|------------|----|---------------|--------|
| | 2011 | % | 2010 | % | \$ | % |
| Cost of goods sold | \$40,171 | 79 | % \$55,161 | 83 | % \$(14,990) | (27)% |
| Cost of contract research and services | 8,899 | 82 | % 10,002 | 77 | % (1,103) | (11)% |
| Net cost of sales and revenues | \$49,070 | 80 | % \$65,163 | 82 | % \$(16,093) | (25)% |

Cost of goods sold decreased 27% for 2011 as compared to 2010, primarily as a result of decreased costs related to solar cell materials and solar cell equipment, partially offset by increased costs related to solar systems and solar module equipment. The decrease in costs of solar cell materials, all to one customer, of 58% in 2011 as compared to 2010 was primarily due to the completion of definite delivery commitments to a solar cell materials contract in the first quarter of 2011. The decrease in costs of solar cell line equipment of 99% in 2011 as compared to 2010 was primarily associated with the completion of a solar cell line to one customer in 2010 as compared to none in 2011. The increase of solar system costs of 27% in 2011 as compared to 2010 was primarily due to increased direct costs to complete a large photovoltaic system project in the fourth quarter of 2011. The increase in solar module equipment costs of 1% in 2011 as compared to 2010 was primarily due to increased associated revenue. As a percentage of sales, cost of goods sold was 79% of sales of goods in 2011 as compared to 83% of sales of goods in 2010. This decrease in the percentage of sales in 2011 is due to a favorable product mix with higher margins in solar module equipment sales, partially offset by lower margin in solar systems and solar cell materials.

Cost of contract research and services decreased 11% for 2011 as compared to 2010, primarily as a result of decreased costs related to optoelectronics and biomedical services. Costs from our optoelectronics processing services decreased 14% in 2011 compared to 2010 as a result of decreased revenue due to the completion of a government cost share contract in the third quarter of 2010. Costs from our biomedical services decreased 10% in 2011 compared to 2010 as a result of decreased associated revenue. Cost of contract research and services as a percentage of related revenue increased to 82% of related revenues in 2011 from 77% in 2010, primarily due to an increase of indirect costs related to an unfavorable utilization of optoelectronics overhead in 2011.

Cost of sales and revenues also includes approximately \$97 thousand and \$103 thousand of stock-based compensation in 2011 and 2010, 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, | | | | Decrease | |
|-------------------------------------|--------------------------|----|------------|----|-------------|-------|
| | 2011 | % | 2010 | % | \$ | % |
| Selling, general and administrative | \$15,483 | 25 | % \$18,116 | 23 | % \$(2,633) | (15)% |
| Internal research and development | 1,026 | 2 | % 1,286 | 1 | % (260) | (20)% |
| Operating expenses | \$16,509 | 27 | % \$19,402 | 24 | % \$(2,893) | (15)% |

Selling, General and Administrative Expenses

Selling, general and administrative expense decreased 15% in 2011 as compared to 2010, primarily as a result of a gain related to the change in value of the deferred compensation plan and a decrease in employee related expenses in the solar and biomedical business units along with a decrease in solar related travel, marketing and commission expenses. Selling, general and administrative expense increased to 25% of sales and revenues in 2011 as compared to 23% in 2010. Selling, general and administrative expense also includes approximately \$272 thousand and \$397 thousand of stock-based compensation in 2011 and 2010, respectively.

Internal Research and Development Expenses

Internal research and development expense decreased 20% in 2011 as compared to 2010, primarily as a result of lower levels of research and development spent in the solar business unit. As a percentage of sales and revenue, internal research and development expenses increased slightly in 2011 when compared to 2010.

Gains on Termination of Contracts

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 in the fourth quarter of 2009 and first quarter of 2010. As a result of a settlement agreement entered into in the first quarter of 2010 and deposits paid by Jiangxi less settlements paid to vendors, we have recognized a gain on termination of contracts of \$837 thousand in the first quarter of 2010. See Note 15 to the consolidated financial statements.

In the fourth quarter of 2010, we determined that a sale agreement with Zhejiang LeYe Photovoltaic Science & Technology Co., Ltd. ("LeYe") related to solar equipment was terminated due to a breach of contract by LeYe. LeYe had failed to make

payments as required by the agreement and has not responded to numerous communications by us. In the fourth quarter of 2010, we recognized a gain on termination of contracts of \$51 thousand which relates to LeYe's non-refundable deposit. See Note 15 to the consolidated financial statements.

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. 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. 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 have been \$11.5 million which would have been paid over time as the services were provided.

Under an amended Memorandum of Agreement ("MOA"), Uni-Chem was to make a \$2.0 million non-refundable deposit to us creditable towards the Module Line Agreement if Uni-Chem made all initial down payments under the three projects noted above. Uni-Chem paid \$1.0 million of this deposit. The remaining \$1.0 million deposit and the associated deposits for the three projects noted above were not paid. On November 24, 2009, the MOA terminated as scheduled 90 days from execution. In 2010, Uni-Chem communicated that it possessed no further intent to provide us with any scheduled payments for the Cell Line or Module Line. On November 30, 2010, we delivered to Uni-Chem a notice stating this matter was closed and that we have retained Uni-Chem's non-refundable deposit. In the fourth quarter of 2010, we recognized a gain on termination of contracts of \$1.0 million which relates to Uni-Chem's non-refundable deposit. See Note 15 to the consolidated financial statements.

In the fourth quarter of 2011, we determined that a purchase and sale agreement with Genus Innovation Ltd. ("Genus") related to a module manufacturing line was terminated due to a breach of contract by Genus. Genus had failed to take delivery of equipment and make payments as required by the agreement. In the third quarter of 2011, we formally notified Genus that they were in breach of the agreement and provided Genus until October 30, 2011 to cure the breach. Genus failed to cure the breach as required by the agreement and we sent Genus formal notification on October 31, 2011 that the agreement was terminated. In the fourth quarter of 2011, we recognized a gain on termination of contracts of \$409 thousand which relates to Genus' non-refundable deposit. See Note 15 to the consolidated financial statements.

Other Income (Expense), Net

We earned interest income of zero and \$16 thousand in 2011 and 2010, respectively. We incurred interest expense of \$141 thousand and \$204 thousand in 2011 and 2010, respectively. The decrease in interest expense is due to lower interest payments associated with the amounts outstanding under the credit facilities with Silicon Valley Bank in 2011 compared with 2010. We had currency exchange gains of \$8 thousand and losses of \$20 thousand during in 2011 and 2010, respectively.

Income Taxes

We recorded an income tax benefit on our loss from continuing operations of \$890 thousand and \$1.1 million in 2011 and 2010, respectively, which was offset by a provision on our income from discontinued operations of \$914 thousand and \$992 thousand in 2011 and 2010, respectively. Gross federal net operating loss carryforwards were approximately

\$14 million as of December 31, 2011 and expire at various times through 2031. We have a full valuation allowance recorded against the net deferred tax assets at December 31, 2011 due to uncertainty regarding realization of these assets in the future.

Income 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.

We recorded net income from discontinued operations of \$1.4 million and \$1.5 million in 2011 and 2010. Included in discontinued operations for 2011 is a net gain on legal settlement of \$2.3 million and an income tax provision of \$914 thousand. Included in the net gain of \$2.3 million is proceeds received from a contract manufacturer of \$2.5 million, less legal costs of \$214 thousand. Included in discontinued operations for 2010 is a gain on sale of business unit to Bard of \$2.6 million and an income tax provision of \$1.0 million. 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 \$162 thousand in 2010. Included in the gain of \$2.6 million is proceeds received from Bard of \$2.9 million, less licenses transferred to Bard of \$42 thousand and legal and professional fees related to complete the sale of \$204 thousand. See Note 16 to the consolidated financial statements.

Net Loss

We reported a net loss of \$1.5 million and \$408 thousand for 2011 and 2010, respectively. Net loss increased approximately \$1.1 million, primarily due to a \$2.2 million decrease in 2011 margin, a \$1.5 million decrease in 2011 gain on termination of contracts and a \$2.6 million gain on sale of business unit favorably impacting 2010, partially offset by a decrease in operating expenses of \$2.9 million in 2011 and a gain on legal settlement of \$2.3 million recorded in 2011.

Liquidity and Capital Resources

| (in thousands) | December 31, | December 31, | Increase (Decrease) | | |
|---------------------------|--------------|--------------|---------------------|------|----|
| | 2011 | 2010 | \$ | % | |
| Cash and cash equivalents | \$4,758 | \$6,259 | \$(1,501) | (24) |)% |
| Working capital | \$5,700 | \$5,166 | \$534 | 10 | % |

Cash and cash equivalents decreased due to cash used in operating activities and to a lesser extent investing activities, partially offset by cash provided by financing activities. The overall increase in working capital is due to a decrease in current liabilities, primarily accounts payable, accrued liabilities and advances on contracts in process, partially offset by a decrease in current assets, primarily cash, accounts receivable, inventories, net and deferred cost of goods sold. 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, 2011, our accumulated deficit was approximately \$14.1 million compared to accumulated deficit of approximately \$12.6 million as of December 31, 2010.

During the first quarter of 2012, we began pursuing an exclusive sales process of our Semiconductor Business Unit and on March 9, 2012, we completed the sale of the Semiconductor Business Unit to Masimo Corporation. The asset purchase agreement provided that the aggregate purchase price for the Semiconductor Business Unit was \$8.0 million plus the assumption of \$500 thousand in liabilities, with the cash portion of the purchase price being reduced by retained cash and liabilities assumed by Masimo in excess of \$500 thousand. As a result, on the closing date we received approximately \$7.2 million in cash (less the escrow described below) and Masimo assumed approximately \$1.2 million in liabilities. The purchase price is subject to post-closing adjustments based on the balance sheet of the business as of the closing date. Of the purchase price, approximately \$717 thousand was deposited into an indemnity escrow account for fifteen months to partially secure our obligations for any indemnity claims under the asset purchase agreement. In connection with this transaction, the lease for the premises in Hudson, New Hampshire where the Semiconductor Business Unit was located was terminated on March 9, 2012, and we were released from all future obligations under the lease as of such date. See Note 17 to the consolidated financial statements.

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 global economic conditions. As a result, we believe we have sufficient resources to finance our current operations through at least December 31, 2012.

Loan Agreements

On June 22, 2009, we entered into two separate credit facilities with Silicon Valley Bank (the “Bank” or “SVB”) 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 parties 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”).

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. Originally, interest on outstanding borrowings accrued at a rate per annum equal to the greater of (i) the prime rate plus 3.0% or (ii) 9.0%; with reductions in the rate if certain events occur, as defined. 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. Originally, interest on outstanding borrowings accrued at a rate per annum equal to the greater of (i) the prime rate plus 3.0% or (ii) 9.0%; 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 were required to continue to make monthly installments of principal of \$97 thousand plus accrued interest until the outstanding balance was paid in full. Interest on the Equipment Term Loan accrued at a rate per annum equal to the greater of (i) the prime rate plus 1.75% or (ii) 7.75%. The final payment with respect to the Equipment Term Loan was made in June, 2010.

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.

On June 15, 2010, we entered into with the Bank (i) the First Loan Modification Agreement amending certain terms of the Second Restated Revolving Credit Facility and (ii) the First Loan Modification Agreement amending certain terms of the Restated Ex-Im Facility (collectively, the “Loan Modifications”). Pursuant to the terms of the Loan Modifications, we agreed to (i) create a letter of credit sub-facility within the our existing credit line, (ii) decrease the interest rate with regard to financed eligible accounts from SVB Prime Rate plus 3.0% per annum to SVB Prime Rate plus 2.5% per annum while (iii) reducing the interest rate floor from 6.0% per annum to 4.0% per annum and (iv) extending the maturity date of the Second Restated Revolving Credit Facility and Restated Ex-Im Facility to December 31, 2011.

On March 31, 2011, the Bank agreed to increase the letter of credit sub-facility under our credit facility with the Bank from \$1.5 million to \$2.5 million. All other terms and conditions under the credit facilities remained the same.

On November 8, 2011, we entered into with the Bank amendments to the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility providing that, during the period from November 8, 2011 until the earlier to occur of the date on which we deliver our November 2011 financial reports to the Bank or December 31, 2011, and provided we maintained liquidity at least equal to twice the amount of our advances drawn and letters of credit issued under the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility, we could borrow (i) up to \$2 million under the Second Restated Revolving Credit Facility and (ii) up to \$5 million under the Restated Ex-Im Facility less the amount of outstanding letters of credit.

On December 30, 2011, we entered into with the Bank amendments to the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility pursuant to which the Bank agreed to (i) extend the maturity date of the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility to December 29, 2012, (ii) provide an aggregate amount of \$6 million under both facilities, with up to \$2 million available under the Second Restated Revolving Credit Facility and up to \$4 million available under the Restated Ex-Im Facility, and (iii) remove the letter of credit sub-facility from the Second Restated Revolving Credit Facility. In addition, if we achieve certain levels of liquidity, based on cash on hand and availability under the credit facility, we will have a 0.5% lower interest rate. In connection with the amendments, a guidance line has been established to support letters of credit in an aggregate amount of up to \$2.5 million through January 31, 2012, and thereafter in an aggregate amount of up to \$1.5 million through December 29, 2012. The letters of credit will be secured by the Bank's existing all asset lien. In addition, if we achieve certain levels of liquidity, based on cash on hand and availability under the credit facility, we will not be required to cash collateralize letters of credit issued under this guidance line. All other terms and conditions under the credit facilities remain the same.

Advances outstanding under the Second Restated Revolving Credit Facility were zero and \$842 thousand at December 31,

2011 and 2010, respectively. Advances outstanding under the Restated Ex-Im Facility were \$1.2 million and \$315 thousand at December 31, 2011 and 2010, respectively. As of December 31, 2011, the interest rate per annum on the Second Restated Revolving Credit Facility and Restated Ex-Im Facility was 6.5% and 6.5%, respectively. We utilized \$1.4 million of the guidance line at December 31, 2011 and utilized \$1.4 million of the letter of credit sub-facility at December 31, 2010. Combined availability under the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility was \$1.7 million as of December 31, 2011.

Gains on Termination of Contracts

In the fourth quarter of 2009, we determined that three purchase and sale agreements with 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 in the fourth quarter of 2009 and first quarter of 2010. As a result of the settlement agreement entered into in the first quarter of 2010 and deposits paid by Jiangxi less settlements paid to vendors, we have recognized a gain on termination of contracts of \$837 thousand in the first quarter of 2010. See Note 15 to the consolidated financial statements.

In the fourth quarter of 2010, we determined that a sale agreement with LeYe related to solar equipment was terminated due to a breach of contract by LeYe. LeYe had failed to make payments as required by the agreement and has not responded to numerous communications by us. In the fourth quarter of 2010, we recognized a gain on termination of contracts of \$51 thousand which relates to LeYe's non-refundable deposit. See Note 15 to the consolidated financial statements.

On August 26, 2009, we entered into the Cell Line Agreement to provide Uni-Chem the Cell Line for \$21.75 million. In addition, on August 26, 2009, we entered into the Module Line Agreement to provide Uni-Chem the Module Line for \$13.25 million. Finally, concurrently with the execution of the Cell Line Agreement and the Module Line Agreement, we entered into 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 have been \$11.5 million which would have been paid over time as the services were provided.

Under the MOA, Uni-Chem was to make a \$2.0 million non-refundable deposit to us creditable towards the Module Line Agreement if Uni-Chem made all initial down payments under the three projects noted above. Uni-Chem paid \$1.0 million of this deposit. The remaining \$1.0 million deposit and the associated deposits for the three projects noted above were not paid. On November 24, 2009, the MOA terminated as scheduled 90 days from execution. In 2010, Uni-Chem communicated that it possessed no further intent to provide us with any scheduled payments for the Cell Line or Module Line. On November 30, 2010, we delivered to Uni-Chem a notice stating this matter was closed and that we retained Uni-Chem's non-refundable deposit. In the fourth quarter of 2010, we recognized a gain on termination of contracts of \$1.0 million which relates to Uni-Chem's non-refundable deposit. See Note 15 to the consolidated financial statements.

In the fourth quarter of 2011, we determined that a purchase and sale agreement with Genus Innovation Ltd. ("Genus") related to a module manufacturing line was terminated due to a breach of contract by Genus. Genus had failed to take delivery of equipment and make payments as required by the agreement. In the third quarter of 2011, Spire formally notified Genus that they were in breach of the agreement and provided Genus until October 30, 2011 to cure the breach. Genus failed to cure the breach as required by the agreement and Spire sent Genus formal notification on October 31, 2011 that the agreement was terminated. In the fourth quarter of 2011, we recognized a gain on

termination of contracts of \$409 thousand which relates to Genus' non-refundable deposit. See Note 15 to the consolidated financial statements.

Gain on Legal Settlement

During the fourth quarter of 2011, we received a cash payment of \$2.5 million in settlement of a breach of contract dispute with a contract manufacturer and in turn recorded a net gain on legal settlement of \$2.3 million. This amount has been recorded as a component of net income from discontinued operations.

Net Cash Used in Operating Activities

Net cash used in operating activities was \$1.1 million and \$3.7 million in 2011 and 2010, respectively. As of December 31, 2011, we had unrestricted cash and cash equivalents of \$4.8 million compared to unrestricted cash and cash equivalents of \$6.3 million as of December 31, 2010. 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 acceptable values. We have developed several plans including cost containment efforts and outside financing

to offset a decline in business due to global economic conditions. As a result, we believe we have sufficient resources to finance our current operations through at least December 31, 2012.

During the first quarter of 2012, we began pursuing an exclusive sales process of our Semiconductor Business Unit and on March 9, 2012, we completed the sale of the Semiconductor Business Unit to Masimo Corporation. The asset purchase agreement provided that the aggregate purchase price for the Semiconductor Business Unit was \$8.0 million plus the assumption of \$500 thousand in liabilities, with the cash portion of the purchase price being reduced by retained cash and liabilities assumed by Masimo in excess of \$500 thousand. As a result, on the closing date we received approximately \$7.2 million in cash (less the escrow described below) and Masimo assumed approximately \$1.2 million in liabilities. The purchase price is subject to post-closing adjustments based on the balance sheet of the business as of the closing date. Of the purchase price, approximately \$717 thousand was deposited into an indemnity escrow account for fifteen months to partially secure our obligations for any indemnity claims under the asset purchase agreement. In connection with this transaction, the lease for the premises in Hudson, New Hampshire where the Semiconductor Business Unit was located was terminated on March 9, 2012, and we were released from all future obligations under the lease as of such date. See Note 17 to the consolidated financial statements.

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

The following table summarizes our gross contractual obligations at December 31, 2011 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 (in thousands) | Payments Due by Period | | | | |
|---|------------------------|---------------------|----------------|----------------|----------------------|
| | Total | Less than 1 Year | 2 - 3 Years | 4 - 5 Years | More Than 5 Years |
| Restated Ex-Im Facility (SVB) | \$1,157 | \$1,157 | — | — | — |
| Purchase obligations | \$2,052 | \$2,012 | \$26 | \$14 | — |
| Unrelated party capital leases | \$64 | \$41 | \$23 | \$— | — |
| Operating leases: | | | | | |
| Unrelated party operating leases | \$293 | \$164 | \$129 | — | — |
| Related party operating leases | \$19,581 | \$3,591 | \$7,602 | \$6,008 | \$2,380 |

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.

The Restated Ex-Im Facility does not include an interest component to the contractual obligation.

Outstanding letters of credit totaled \$1.5 million and \$1.4 million at December 31, 2011 and 2010, 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. At December 31, 2011 and December 31, 2010, \$21 thousand was secured by restricted cash and \$1.4 million was secured by the Second Restated Revolving Credit Facility.

In connection with sale of the Semiconductor Business Unit, the Hudson lease was terminated on March 9, 2012 and the Company was released from all future obligations under the lease as of that date, including future rent payments of \$4.9 million, included in related party operating leases. These payment obligations in the amounts of \$1.0 million, \$2.9 million and \$1.0 million would have been paid in the periods of less than one year, two to three years, and four to

five years, respectively.

Recent Accounting Pronouncements

In June 2011, the Financial Accounting Standards Board ("FASB") issued Accounting Standard Update ("ASU") No. 2011-05 ("ASU 2011-05"), Presentation of Comprehensive Income. The update eliminates the option to present the components of other comprehensive income as part of the statement of stockholders' equity. Instead, entities must report comprehensive income in either a single continuous statement of comprehensive income which contains two sections, net income and other comprehensive income, or in two separate but consecutive statements. The update will be effective for public companies for interim and annual periods beginning after December 15, 2011 with early adoption permitted. We do not believe that the application of the provision of ASU 2011-05 will have a material impact on our consolidated financial statements.

In May 2011, the FASB issued ASU No. 2011-04 ("ASU 2011-04"), Amendments to Achieve Common Fair Value

Measurement and Disclosure Requirements in U.S. GAAP and International Financial Reporting Standards, an amendment to FASB Accounting Standards Codification (“ASC”) Topic 820, Fair Value Measurement. The update revises the application of the valuation premise of highest and best use of an asset, the application of premiums and discounts for fair value determination, as well as the required disclosures for transfers between Level 1 and Level 2 fair value measures and the highest and best use of nonfinancial assets. The update provides additional disclosures regarding Level 3 fair value measurements and clarifies certain other existing disclosure requirements. The update will be effective for public companies for interim and annual periods beginning after December 15, 2011 with early adoption prohibited. We do not believe that the application of the provision of ASU 2011-04 will have a material impact on our consolidated financial statements.

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 sales 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. 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. We had no hedging activity in 2011 and 2010. Foreign exchange gain (loss) included in other expense, net was a gain of approximately \$8 thousand and a loss of approximately \$20 thousand for the years ended December 31, 2011 and 2010, respectively.

Related Party Transactions

On November 30, 2007, we entered into a new Lease Agreement (the “Bedford Lease”) with SPI-Trust, a Trust of which Roger G. Little, Chairman of the Board, Chief Executive Officer and President of the Company, is the sole trustee and principal beneficiary, 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 was originally set to expire on November 30, 2012. The annual rental rate for the first year of the Bedford Lease was \$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 increased on each anniversary by \$0.75 per square foot.

On September 17, 2010, we entered into the First Amendment to Lease Agreement with SPI-Trust to amend the Bedford Lease. The term of the Bedford Lease was extended for an additional five (5) years to expire on November 30, 2017. The annual rental rate for the first year of the extended term (December 1, 2012 through November 30, 2013) is \$16.00 per square foot on a triple net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. After the first year of the extended term of the Bedford Lease, the annual rental rate increases on each anniversary by \$0.50 per square foot. We have the right to further extend the term of the Bedford Lease for an additional five (5) year period. If we exercise this right to further extend the term of the Bedford Lease,

the annual rental rate for the first year of the further 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 \$0.50 per square foot. Additionally, SPITrust agreed to reimburse us up to \$50 thousand for all costs incurred by us in connection with any alterations or improvements to the premises or repairs or replacements to the heating and air conditioning systems. We believe that the terms of the Bedford Lease, as amended, are commercially reasonable. Rent expense under the Bedford Lease was \$2.3 million and \$2.1 million for the year ended December 31, 2011 and 2010, respectively.

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 was to continue for seven (7) years until August 31, 2015. 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. In addition, we were 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 were commercially reasonable and reflective of market rates. The Hudson Lease is classified as a related party operating lease. Rent expense under the Hudson Lease was \$1.3 million for the years ended December 31, 2011 and 2010, respectively. In connection with sale of the Semiconductor Business Unit, the lease was terminated on March 9, 2012 and we were released from all future obligations under the lease as of that date. The security deposit of \$300 thousand will be used to off-set rent payments in the first quarter of 2012. See Note 17 to the consolidated financial statements.

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, reserve for excess and obsolete inventory, impairment of long-lived assets, stock-based compensation 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 Note 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 collectability 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 (original equipment manufacturer) 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 Carriage and Insurance Paid (or CIP), or on rare situations, a Delivery Duty Unpaid (or DDU) basis. It is our policy to recognize revenues for this equipment when title of the product has passed to the customer, provided that 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. Typically, we are able to separate arrangements with multiple elements into more than one unit of accounting as it relates to the passage of title, training and installation services. We allocate total fees under contract to each element using the relative selling price method and revenue is recognized upon delivery of each element. Our management performs extensive analysis to determine the relative selling price of each unit of accounting. We allocate revenue in arrangements using our best estimate of selling price if neither vendor-specific objective evidence ("VSOE") nor third-party evidence ("TPE") of selling price exists. We determine estimated selling price ("ESP") of each deliverable based on a number of factors, including internal costs,

gross margin targets and historical sales of similar units, as well as external factors such as market and competitive conditions.

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.

Our biomedical business provides advanced medical device surface treatment processes for performance improvement of orthopedic devices. It is our policy to recognize revenues from these services when services are provided to the customer.

Our optoelectronics business provided wafer epitaxial growth services, compound semiconductor foundry services and device fabrication. It is our policy to recognize revenues from these goods and services when title of the product passes to the customer or when services are provided. On March 9, 2012, we completed the sale of this business to Masimo Corporation. See

Note 17 to the consolidated financial statements.

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.

In October 2009, the FASB issued Accounting Standard Update No. 2009-13 (“ASU 2009-13”), Multiple Deliverable Revenue Arrangements, amending the accounting standards for multiple-element revenue arrangements to:

- provide updated guidance on how multiple deliverables that exist in an arrangement should be separated, and how the consideration should be allocated;
- require an entity to allocate revenue in an arrangement using ESP of each element if a vendor does not have VSOE or TPE of selling price; and
- eliminate the use of the residual method and require a vendor to allocate revenue using the relative selling price method.

We applied the provisions of ASC 605-25 prospectively for applicable arrangements entered into or materially modified after January 1, 2011 (the beginning of our fiscal year), which had a material impact on our consolidated financial statements. Total net sales and revenues for the year ended December 31, 2011 were \$61.6 million with the application of ASC 605-25 and would have been approximately \$57.7 million had we not applied ASC 605-25.

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.

Inventories and Reserve for Excess and Obsolescence

We perform a detailed assessment of inventory at each balance sheet date, which includes a review of, among other factors, an estimate of future demand for products within specific time horizons, valuation of existing inventory, as well as product lifecycle and product development plans. Inventory reserves are also provided to cover risks arising from slow-moving items. We write down our inventory for estimated obsolescence or unmarketable inventory equal to the difference between the cost of inventory and the estimated market value based on assumptions about future demand and market conditions. We may be required to record additional inventory write-downs if actual market conditions are less favorable than those projected by our management.

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.

Stock-Based Compensation

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We account for our stock-based compensation plans in accordance with the fair value recognition provisions of ASC 718 Compensation—Stock Compensation. We utilize 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:

We generally warrant solar energy module manufacturing equipment sold for a total of 360 days, which include the replacement of defective component parts and the labor to correct the defect.

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, 2011 and 2010 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 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 audit 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, an audit 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, 2011 and 2010, 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.

MCGLADREY & PULLEN, LLP

Boston, Massachusetts
March 15, 2012

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

| | December 31, 2011 | December 31, 2010 |
|--|----------------------|----------------------|
| Assets | | |
| Current assets | | |
| Cash and cash equivalents | \$ 4,758 | \$ 6,259 |
| Restricted cash | 21 | 21 |
| Accounts receivable – trade, net | 3,771 | 7,324 |
| Inventories, net | 7,490 | 10,932 |
| Deferred cost of goods sold | 180 | 1,018 |
| Deposits on equipment for inventory | 609 | 88 |
| Prepaid expenses and other current assets | 807 | 809 |
| Total current assets | 17,636 | 26,451 |
| Property and equipment, net | 3,281 | 4,588 |
| Intangible and other assets, net | 556 | 820 |
| Available-for-sale investments, at quoted market value (cost of \$2,204 and \$1,980 at December 31, 2011 and 2010, respectively) | 2,405 | 2,426 |
| Deposit – related party | 300 | 300 |
| Total assets | \$ 24,178 | \$ 34,585 |
| Liabilities and Stockholders' Equity | | |
| Current liabilities | | |
| Current portion of capital lease obligation | \$ 37 | \$ 44 |
| Revolving line of credit | 1,157 | 1,157 |
| Accounts payable | 4,517 | 6,487 |
| Accrued liabilities | 3,681 | 4,221 |
| Advances on contracts in progress | 2,427 | 9,010 |
| Liabilities of discontinued operations | 117 | 366 |
| Total current liabilities | 11,936 | 21,285 |
| Long-term portion of capital lease obligation | 21 | 58 |
| Deferred compensation | 2,405 | 2,426 |
| Other long-term liabilities | 1,106 | 911 |
| Total long-term liabilities | 3,532 | 3,395 |
| Total liabilities | 15,468 | 24,680 |
| Stockholders' equity | | |
| Common stock, \$0.01 par value; 20,000,000 shares authorized; 8,562,633 and 8,360,133 shares issued and outstanding on December 31, 2011 and December 31, 2010, respectively | 86 | 84 |
| Additional paid-in capital | 22,510 | 21,979 |
| Accumulated deficit | (14,087 |) (12,604) |
| Accumulated other comprehensive income | 201 | 446 |
| Total stockholders' equity | 8,710 | 9,905 |
| Total liabilities and stockholders' equity | \$ 24,178 | \$ 34,585 |

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, | |
|--|--------------------------|-----------|
| | 2011 | 2010 |
| Net sales and revenues | | |
| Sales of goods | \$50,744 | \$66,736 |
| Contract research and service revenues | 10,814 | 13,106 |
| Total net sales and revenues | 61,558 | 79,842 |
| Cost of sales and revenues | | |
| Cost of goods sold | 40,171 | 55,161 |
| Cost of contract research and services | 8,899 | 10,002 |
| Total cost of sales and revenues | 49,070 | 65,163 |
| Gross margin | 12,488 | 14,679 |
| Operating expenses | | |
| Selling, general and administrative expenses | 15,483 | 18,116 |
| Internal research and development expenses | 1,026 | 1,286 |
| Total operating expenses | 16,509 | 19,402 |
| Gain on termination of contracts | 409 | 1,888 |
| Operating loss from continuing operations | (3,612) | (2,835) |
| Interest expense, net | (141) | (188) |
| Foreign exchange gain (loss) | 8 | (20) |
| Total other expense, net | (133) | (208) |
| Loss from continuing operations before income tax benefit | (3,745) | (3,043) |
| Income tax benefit - continuing operations | 890 | 1,146 |
| Loss from continuing operations | (2,855) | (1,897) |
| Loss from discontinued operations before sale of business unit | — | (123) |
| Gain on sale of business unit, net of transaction expenses | — | 2,604 |
| Gain on legal settlement, net of transaction expenses | 2,286 | — |
| Income tax provision - discontinued operations | (914) | (992) |
| Income from discontinued operations, net of tax | 1,372 | 1,489 |
| Net loss | \$(1,483) | \$(408) |
| Basic and diluted income (loss) per share: | | |
| From continuing operations, net of tax | (0.34) | (0.23) |
| From discontinued operations, net of tax | 0.16 | 0.18 |
| Basic and diluted loss per share | (0.18) | (0.05) |
| Weighted average number of common and common equivalent shares outstanding – basic | 8,386,188 | 8,341,356 |

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| | | |
|---|-----------|-----------|
| Weighted average number of common and common equivalent shares outstanding – diluted | 8,386,188 | 8,341,356 |
|---|-----------|-----------|

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

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SPIRE CORPORATION AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY AND COMPREHENSIVE INCOME (LOSS)

(in thousands, except share amounts)

| | Common Stock | | Additional Paid-in Capital | Accumulated Deficit | Accumulated Other Comprehensive Income | Total |
|---|--------------|--------|----------------------------------|------------------------|---|---------|
| | Shares | Amount | | | | |
| Balance, December 31, 2009 | 8,334,688 | \$83 | \$21,383 | \$(12,196) |) \$234 | \$9,504 |
| Exercise of stock options | 25,445 | 1 | 96 | — | — | 97 |
| Stock-based compensation | — | — | 500 | — | — | 500 |
| Net change in unrealized gain on available for sale marketable securities | — | — | — | — | 212 | 212 |
| Net loss | — | — | — | (408) |) — | (408) |
| Balance, December 31, 2010 | 8,360,133 | \$84 | \$21,979 | \$(12,604) |) \$446 | \$9,905 |
| Issuance of common stock | 200,000 | 2 | 154 | — | — | 156 |
| Exercise of stock options | 2,500 | — | 8 | — | — | 8 |
| Stock-based compensation | — | — | 369 | — | — | 369 |
| Net change in unrealized gain on available for sale marketable securities | — | — | — | — | (245) |) (245) |
| Net loss | — | — | — | (1,483) |) — | (1,483) |
| Balance, December 31, 2011 | 8,562,633 | \$86 | \$22,510 | \$(14,087) |) \$201 | \$8,710 |

| (in thousands) | Years Ended December 31, | |
|---|--------------------------|-----------|
| | 2011 | 2010 |
| Comprehensive loss is calculated as follows: | | |
| Net loss | \$(1,483) |) \$(408) |
| Net change in unrealized gain on available for sale marketable securities | (245) |) 212 |
| Comprehensive loss | \$(1,728) |) \$(196) |

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 December 31, | |
|--|------------------------------|-----------|
| | 2011 | 2010 |
| Cash flows from operating activities: | | |
| Net loss | \$(1,483 |) \$(408 |
| Less: Net income from discontinued operations, net of tax | 1,372 | 1,489 |
| Net loss from continuing operations | (2,855 |) (1,897 |
| Adjustments to reconcile net loss to net cash used in operating activities: | | |
| Depreciation and amortization | 1,834 | 1,689 |
| Deferred tax benefit | (914 |) (992 |
| Deferred compensation | (245 |) 212 |
| Stock-based compensation | 369 | 500 |
| Reversal of accounts receivable reserves | (41 |) (90 |
| Provision for inventory reserve | 686 | 265 |
| Changes in assets and liabilities: | | |
| Restricted cash | — | 1,480 |
| Accounts receivable | 3,594 | (1,344 |
| Inventories | 2,756 | 9,292 |
| Deferred cost of goods sold | 838 | 5,570 |
| Deposits, prepaid expenses and other current assets | (419 |) 463 |
| Accounts payable, accrued liabilities and other liabilities | (2,159 |) (4,862 |
| Advances on contracts in progress | (6,583 |) (12,702 |
| Net cash used in operating activities of continuing operations | (3,139 |) (2,416 |
| Net cash provided by (used in) operating activities of discontinued operations | 2,037 | (1,278 |
| Net cash used in operating activities | (1,102 |) (3,694 |
| Cash flows from investing activities: | | |
| Purchase of property and equipment | (279 |) (817 |
| Additions to intangible and other assets | (84 |) (165 |
| Net cash used in investing activities of continuing operations | (363 |) (982 |
| Net cash provided by investing activities of discontinued operations | — | 2,646 |
| Net cash (used in) provided by investing activities | (363 |) 1,664 |
| Cash flows from financing activities: | | |
| Principal payments on capital lease obligations | (44 |) (39 |
| Principal payments on equipment and revolving line of credit, net | — | (768 |
| Proceeds from exercise of stock options | 8 | 97 |
| Net cash used in financing activities | (36 |) (710 |
| Net decrease in cash and cash equivalents | (1,501 |) (2,740 |
| Cash and cash equivalents, beginning of year | 6,259 | 8,999 |
| Cash and cash equivalents, end of year | \$4,758 | \$6,259 |
| Supplemental disclosures of cash flow information: | | |
| Interest paid | \$141 | \$204 |
| Interest received | \$— | \$16 |
| Income taxes refunded | \$(36 |) \$(241 |
| Supplemental disclosures of non-cash flow information: | | |
| Liabilities converted to common stock | \$156 | \$— |

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

SPIRE CORPORATION AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

December 31, 2011 and 2010

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 and systems for the photovoltaic 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 photovoltaic solar area, the Company develops, manufactures and markets specialized equipment for the production of terrestrial photovoltaic modules from solar cells and provide photovoltaic systems for grid connected applications in the commercial markets. The Company's equipment has been installed in approximately 200 factories in 50 countries. The equipment market is very competitive with major competitors located in Japan and Switzerland. The Company's flagship product is its Sun Simulator which tests module performance. The Company's other product offerings include turn-key module lines and to a lesser extent other individual equipment. To compete the Company offers other services such as training and assistance with module certification. The Company also provides turn-key services to its customers to backward integrate to solar cell manufacturing. At times, the Company supplies materials such as solar cells to certain customers.

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 perform sponsored research programs into practical applications of advanced biomedical and biophotonic technologies.

With respect to optoelectronics, on March 9, 2012, the Company completed the sale of its semiconductor business unit, which provides semiconductor foundry services, operates a semiconductor foundry and fabrication facility and is engaged in the business of wafer epitaxy, foundry services, and device fabrication for the defense, medical, telecommunications and consumer products markets (the "Semiconductor Business Unit"), to Masimo Corporation. See Note 17 to the consolidated financial statements.

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. ("Bard"). Accordingly, the results of operations and liabilities of the Medical Products Business Unit are being presented herein as discontinued operations. See Note 16 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 our solar equipment line and delivery of solar systems. Export sales, which amounted to 48% and 39% of net sales and revenues for 2011 and 2010, respectively, continue to constitute a significant portion of the Company's net sales and revenues.

The Company has incurred operating losses from continuing operations. Operating loss from continuing operations was \$3.6 million and \$2.8 million in 2011 and 2010, respectively. Net cash used in operating activities was \$1.1 million and \$3.7 million in 2011 and 2010, respectively. As of December 31, 2011, the Company had unrestricted

cash and cash equivalents of \$4.8 million compared to \$6.3 million as of December 31, 2010. The Company has 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 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 acceptable values. The maturity date of the Company's credit facilities is December 29, 2012. The Company has developed several plans including cost containment efforts and outside financing to offset a decline in business due to global economic conditions. As a result, the Company believes it has sufficient resources to finance its current operations through at least December 31, 2012.

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. 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 collectability 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 Bedford, Massachusetts (or EX-Works Factory) basis and other orders are sold on a Carriage and Insurance Paid (or CIP), or on rare situations, a Delivery Duty Unpaid (or DDU) basis. It is the Company's policy to recognize revenues for this equipment when title of the product has passed to the customer, provided that 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. Typically, the Company is able to separate arrangements with multiple elements into more than one unit of accounting as it relates to the passage of title, training and installation services. The Company allocates total fees under contract to each element using the relative selling price method and revenue is recognized upon delivery of each element. The Company's management performs extensive analysis to determine the relative selling price of each unit of accounting. The Company allocates revenue in arrangements using its best estimate of selling price if neither vendor-specific objective evidence ("VSOE") nor third-party evidence ("TPE") of selling price exists. The Company determines estimated selling price ("ESP") of each deliverable based on a number of factors, including internal costs, gross margin targets and historical sales of similar units, as well as external factors such as market and competitive conditions.

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 contact. It is the Company's policy to recognize revenues for these materials as title passes and the government accepts the materials.

The Company's biomedical business provides advanced medical device surface treatment processes for performance improvement of orthopedic devices. It is the Company's policy to recognize revenues from these services when services are provided to the customer.

The Company's optoelectronics business provided wafer epitaxial growth services, compound semiconductor foundry services and device fabrication. It is the Company's policy to recognize revenues from these goods and services when title of the product passes to the customer or when services are provided. On March 9, 2012, the Company completed the sale of this business to Masimo Corporation. See Note 17 to the consolidated financial statements.

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.

In October 2009, the FASB issued Accounting Standard Update No. 2009-13 ("ASU 2009-13"), Multiple Deliverable Revenue Arrangements, amending the accounting standards for multiple-element revenue arrangements to:

- provide updated guidance on how multiple deliverables that exist in an arrangement should be separated, and how the consideration should be allocated;
- require an entity to allocate revenue in an arrangement using ESP of each element if a vendor does not have VSOE or TPE of selling price; and
- eliminate the use of the residual method and require a vendor to allocate revenue using the relative selling price

method.

The Company applied the provisions of ASC 605-25 prospectively for applicable arrangements entered into or materially modified after January 1, 2011 (the beginning of the Company's fiscal year), which had a material impact on the Company's consolidated financial statements. Total net sales and revenues for the year ended December 31, 2011 were \$61.6 million with the application of ASC 605-25 and would have been approximately \$57.7 million had the Company not applied ASC 605-25.

(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 assets held as part of the Spire Corporation Non-Qualified Deferred Compensation Plan. 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 income. As disclosed below, the unrealized gain on these marketable securities was \$201 thousand and \$446 thousand as of December 31, 2011 and 2010, respectively.

| (in thousands) | Available-for-sale Investments |
|--|-----------------------------------|
| Balance, December 31, 2010 | \$ 446 |
| Net change in unrealized gain on available for sale marketable securities | (245) |
| Balance, December 31, 2011 | \$ 201 |

(e) Fair Value Measurements

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 820-10, 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 820-10, 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.

Valuation Techniques

Fair value is a market-based measure considered from the perspective of a market participant who would buy the asset or assume the liability rather than the Company's own specific measure. All of the Company's fixed income securities are priced using a variety of daily data sources, largely readily-available market data and broker quotes. To validate these prices, the Company compares the fair market values of the Company's fixed income investments using market data from observable and corroborated sources. The Company also performs the fair value calculations for its common stock and mutual fund securities using market data from observable and corroborated sources. In periods of market inactivity, the observability of prices and inputs may be reduced for certain instruments. This condition could cause an instrument to be reclassified from Level 1 to Level 2 or from Level 2 to Level 3. During twelve months ended December 31, 2011, none of the Company's instruments were reclassified between Level 1, Level 2 or Level 3.

The following table presents the financial instruments related to the Company's available-for-sale investments carried at fair value on a recurring basis as of December 31, 2011 and 2010 by ASC 820-10 valuation hierarchy (as defined above).

| (in thousands) | Balance of December 31, 2011 | Level 1 | Level 2 | Level 3 |
|---|---------------------------------|---------|---------|---------|
| Cash and short term investments | \$65 | \$65 | \$— | \$— |
| Common Stock | | | | |
| Basic Materials | 72 | 72 | — | — |
| Consumer Goods | 18 | 18 | — | — |
| Financial | 48 | 48 | — | — |
| Healthcare | 53 | 53 | — | — |
| Industrial Goods | 22 | 22 | — | — |
| Services | 78 | 78 | — | — |
| Technology | 151 | 151 | — | — |
| Total Common Stock | 442 | 442 | — | — |
| Mutual Fund | | | | |
| Diversified Emerging Markets | 155 | — | 155 | — |
| Foreign Large Blend | 123 | — | 123 | — |
| Foreign Large Growth | 171 | — | 171 | — |
| Foreign Small/Mid Value | 136 | — | 136 | — |
| Value Fund | 69 | — | 69 | — |
| Large Growth | 490 | — | 490 | — |
| Small Blend Total | 192 | 192 | — | — |
| Total Mutual Funds | 1,336 | 192 | 1,144 | — |
| Fixed Income | | | | |
| Domestic | 535 | — | 535 | — |
| International | 27 | — | 27 | — |
| Total Fixed Income | 562 | — | 562 | — |
| Total available for-sale-investments ⁽¹⁾ | \$2,405 | \$699 | \$1,706 | \$— |
| Percent of total | 100 | % 29 | % 71 | % — |

| (in thousands) | Balance of December 31, 2010 | Level 1 | Level 2 | Level 3 |
|---|---------------------------------|---------|----------|---------|
| Cash and short term investments | \$ 271 | \$ 271 | \$ — | \$ — |
| Common Stock | | | | |
| Basic Materials | 79 | 79 | — | — |
| Consumer Goods | 10 | 10 | — | — |
| Financial | 60 | 60 | — | — |
| Healthcare | 44 | 44 | — | — |
| Industrial Goods | 31 | 31 | — | — |
| Services | 78 | 78 | — | — |
| Technology | 47 | 47 | — | — |
| Total Common Stock | 349 | 349 | — | — |
| Mutual Fund | | | | |
| Diversified Emerging Markets | 220 | — | 220 | — |
| Foreign Large Blend | 128 | — | 128 | — |
| Foreign Large Growth | 170 | — | 170 | — |
| Foreign Small/Mid Value | 133 | — | 133 | — |
| Value Fund | 79 | — | 79 | — |
| Large Growth | 459 | — | 459 | — |
| Small Blend Total | 211 | 211 | — | — |
| Total Mutual Funds | 1,400 | 211 | 1,189 | — |
| Fixed Income | | | | |
| Domestic | 386 | — | 386 | — |
| International | 20 | — | 20 | — |
| Total Fixed Income | 406 | — | 406 | — |
| Total available for-sale-investments ⁽¹⁾ | \$ 2,426 | \$ 831 | \$ 1,595 | \$ — |
| Percent of total | 100 | % 34 | % 66 | % — |

(1) Changes in the fair value of available-for-sale investments are recorded in accumulated other comprehensive income, a component of stockholders' equity, in the Company's consolidated balance sheets.

The carrying amounts reflected in the Company's consolidated balance sheets for cash, accounts receivable, prepaid expenses and other current assets, accounts payable, accrued expenses, and capital lease obligations approximates fair value due to their short-term maturities. The fair value of the Company's revolving line of credit 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 mature of the remaining maturities, frequency of amendments to its terms and the variable interest rates, the carrying value of the revolving line of credit approximates fair value at December 31, 2011.

(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:

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| | |
|---|---|
| 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 \$177 thousand and \$244 thousand, net of accumulated amortization of \$877 thousand and \$795 thousand, at December 31, 2011 and 2010, respectively. Licenses amounted to \$65 thousand and \$71 thousand, net of accumulated amortization of \$10 thousand and \$4 thousand, at December 31, 2011 and 2010, 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. License cost is composed of the cost to acquire rights to the underlying technology or know-how. 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 \$248 thousand for the year ended December 31, 2011 which includes \$160 thousand of patents pending that were abandoned and written-off during the year. Amortization expense, relating to patents and licenses, was approximately \$87 thousand for the year ended December 31, 2010.

The table below includes future amortization expense for patents and licenses owned by the Company as well as estimated amortization expense related to patents that remain pending at December 31, 2011 of \$151 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 period ending December 31, is as follows:

| (in thousands) | Amortization Expense |
|-----------------|----------------------|
| 2012 | \$100 |
| 2013 | 95 |
| 2014 | 86 |
| 2015 | 38 |
| 2016 | 35 |
| 2017 and future | 39 |
| | \$393 |

Also included in other assets are refundable deposits made by the Company of approximately \$163 thousand and \$250 thousand at December 31, 2011 and 2010, 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. The Company evaluated long-lived assets for impairment for the years ended December 31, 2011 and 2010 and determined that an impairment charge was not required for either year. The Company disposed of abandoned patents pending in the amount of \$160 thousand and zero for the year ended December 31, 2011 and 2010, respectively.

(j) Income Taxes

In accordance with ASC 740, Accounting for Income Taxes, the Company recognizes deferred income taxes based on the

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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, 2007, 2008, 2009, 2010 and 2011, 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 generally warrants solar energy module manufacturing equipment sold for a total of 360 days, which include the replacement of defective component parts and the labor to correct the defect.

Spire Biomedical warrants that its services will meet the agreed upon specifications.

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, 2011 and 2010. The changes in the product warranties for the years ended December 31, 2011 and 2010, are as follows:
(in thousands)

| | | |
|------------------------------|-------|---|
| Balance at December 31, 2009 | \$750 | |
| Provision charged to income | 904 | |
| Usage | (760 |) |
| Balance at December 31, 2010 | 894 | |
| Provision charged to income | 507 | |
| Usage | (588 |) |
| Balance at December 31, 2011 | \$813 | |

(l) Internal Research and Development Costs

Internal research and development costs are charged to operations as incurred. During the years ended December 31, 2011 and 2010, Company funded research and development costs were approximately \$1.0 million and \$1.3 million, respectively.

(m) Loss Per Share

Basic loss per share is computed by dividing loss available to common stockholders by the weighted-average number of common shares outstanding during the period. Diluted loss per share gives effect to all potential dilutive common shares outstanding during the period. The computation of diluted loss per share does not assume conversion, exercise or contingent exercise of securities that would have an anti-dilutive effect on loss per share. The Company did not pay any dividends in 2011 and 2010.

(n) Comprehensive Income (Loss)

Comprehensive income is comprised of net income (loss) and other comprehensive income. Other comprehensive income

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includes certain changes in equity that are excluded from net income. Other comprehensive income was comprised of an unrealized loss of available-for-sale investments of approximately \$245 thousand and an unrealized gain of available-for-sale investments of approximately \$212 thousand during the years ended December 31, 2011 and 2010, 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 utilizes 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, the assessment of excess and obsolete inventory, impairment of long-lived assets, stock-based compensation and warranty reserves. Actual results could differ from those estimates.

(q) Financial Instruments

Financial instruments of the Company consist of cash and cash equivalents, accounts receivable, available for sale marketable securities, accounts payable, 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. 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 Company had no hedging activity in 2011 and 2010. Foreign exchange gain (loss) included in other expense, net was a gain of approximately \$8 thousand and a loss of approximately \$20 thousand for the years ended December 31, 2011 and 2010, respectively.

(t) 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.

(u) Subsequent Events

The Company evaluates all events or transactions through the date of the related filing, in accordance with the provisions of ASC 855, Subsequent Events. Except as noted in Note 17, through the date of this filing, the Company did not have any material subsequent events that impacted its consolidated financial statements or disclosures.

(v) New Accounting Standards

In June 2011, the Financial Accounting Standards Board ("FASB") issued Accounting Standard Update ("ASU") No. 2011-05 ("ASU 2011-05"), Presentation of Comprehensive Income. The update eliminates the option to present the components of other

comprehensive income as part of the statement of stockholders' equity. Instead, entities must report comprehensive income in either a single continuous statement of comprehensive income which contains two sections, net income and other comprehensive income, or in two separate but consecutive statements. The update will be effective for public companies for interim and annual periods beginning after December 15, 2011 with early adoption permitted. The Company does not believe that the application of the provision of ASU 2011-05 will have a material impact on its consolidated financial statements.

In May 2011, the FASB issued ASU No. 2011-04 ("ASU 2011-04"), Amendments to Achieve Common Fair Value Measurement and Disclosure Requirements in U.S. GAAP and International Financial Reporting Standards, an amendment to FASB Accounting Standards Codification ("ASC") Topic 820, Fair Value Measurement. The update revises the application of the valuation premise of highest and best use of an asset, the application of premiums and discounts for fair value determination, as well as the required disclosures for transfers between Level 1 and Level 2 fair value measures and the highest and best use of nonfinancial assets. The update provides additional disclosures regarding Level 3 fair value measurements and clarifies certain other existing disclosure requirements. The update will be effective for public companies for interim and annual periods beginning after December 15, 2011 with early adoption prohibited. The Company does not believe that the application of the provision of ASU 2011-04 will have a material impact on its consolidated financial statements.

3. Accounts Receivable/Advances on Contracts in Progress

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

| (in thousands) | 2011 | 2010 |
|---------------------------------------|---------|---------|
| Amounts billed | \$3,634 | \$7,196 |
| Accrued revenue | 177 | 258 |
| | 3,811 | 7,454 |
| Less: Allowance for doubtful accounts | (40 |) (130 |
| Net accounts receivable - trade | \$3,771 | \$7,324 |
| Advances on contracts in progress | \$2,427 | \$9,010 |

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. The Company received payments of \$64 thousand and \$128 thousand for the years ended December 31, 2011 and 2010, respectively, against amounts which had been previously reserved for in allowance for doubtful accounts.

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

4. Inventories and Deferred Cost of Goods Sold

Inventories, net of \$860 thousand and \$425 thousand of reserves at December 31, 2011 and 2010, respectively, and deferred cost of goods sold consist of the following at December 31:

| (in thousands) | 2011 | 2010 |
|-----------------------------|---------|----------|
| Raw materials | \$2,435 | \$2,919 |
| Work in process | 4,057 | 4,262 |
| Finished goods | 998 | 3,751 |
| Net inventory | \$7,490 | \$10,932 |
| Deferred cost of goods sold | \$180 | \$1,018 |

The Company wrote-off \$184 thousand and \$260 thousand of excess and obsolete inventory for the years ended December 31, 2011 and 2010, 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:

| (in thousands) | 2011 | 2010 |
|---|----------|----------|
| Machinery and equipment | \$19,100 | 18,884 |
| Furniture fixtures and computer equipment | 4,940 | 4,895 |
| Leasehold improvements | 3,786 | 3,644 |
| Construction in progress | 105 | 229 |
| | 27,931 | 27,652 |
| Accumulated depreciation and amortization | (24,650) | (23,064) |
| | \$3,281 | \$4,588 |

Depreciation expense relating to property and equipment was approximately \$1.6 million for the years ended December 31, 2011 and 2010, respectively.

6. Accrued Liabilities

Accrued liabilities include the following at December 31:

| (in thousands) | 2011 | 2010 |
|-----------------------------------|---------|---------|
| Accrued payroll and payroll taxes | \$926 | \$977 |
| Accrued professional fees | 192 | 262 |
| Accrued accounts payable | 638 | 1,353 |
| Accrued Warranty | 813 | 894 |
| Accrued other | 1,112 | 735 |
| | \$3,681 | \$4,221 |

7. Notes Payable and Credit Arrangements

On June 22, 2009, the Company entered into two separate credit facilities with Silicon Valley Bank (the “Bank” or “SVB”) providing for credit lines of up to \$8 million in the aggregate: (i) an Amended and Restated Loan and Security Agreement (the

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“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 parties 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”).

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. Originally, interest on outstanding borrowings accrued at a rate per annum equal to the greater of (i) the prime rate plus 3.0% or (ii) 9.0%; with reductions in the rate if certain events occur, as defined. 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. Originally, interest on outstanding borrowings accrued at a rate per annum equal to the greater of (i) the prime rate plus 3.0% or (ii) 9.0%; 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 was required to continue to make monthly installments of principal of \$97 thousand plus accrued interest until the outstanding balance was paid in full. Interest on the Equipment Term Loan accrued at a rate per annum equal to the greater of (i) the prime rate plus 1.75% or (ii) 7.75%. The final payment with respect to the Equipment Term Loan was made in June, 2010.

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 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 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.

On June 15, 2010, the Company and the Bank entered into (i) the First Loan Modification Agreement amending certain terms of the Second Restated Revolving Credit Facility and (ii) the First Loan Modification Agreement amending certain terms of the Restated Ex-Im Facility (collectively, the "Loan Modifications"). Pursuant to the terms of the Loan Modifications, the Company and the Bank agreed to (i) create a letter of credit sub-facility within the Company's existing credit line, (ii) decrease the interest rate with regard to financed eligible accounts from SVB Prime Rate plus 3.0% per annum to SVB Prime Rate plus 2.5% per annum while (iii) reducing the interest rate floor from 6.0% per annum to 4.0% per annum and (iv) extending the maturity date of the Second Restated Revolving Credit Facility and Restated Ex-Im Facility to December 31, 2011.

On March 31, 2011, the Bank agreed to increase the letter of credit sub-facility under the Company's credit facility with the Bank from \$1.5 million to \$2.5 million. All other terms and conditions under the credit facilities remained the same.

On November 8, 2011, the Company and the Bank entered into amendments to the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility providing that, during the period from November 8, 2011 until the earlier to occur of the date on which the Company delivers its November 2011 financial reports to the Bank or December 31, 2011, and provided the Company maintained liquidity at least equal to twice the amount of its advances drawn and letters of credit issued under the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility, the Company could borrow (i) up to \$2 million under the

Second Restated Revolving Credit Facility and (ii) up to \$5 million under the Restated Ex-Im Facility less the amount of outstanding letters of credit.

On December 30, 2011, the Company entered into with the Bank amendments to the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility pursuant to which the Bank agreed to (i) extend the maturity date of the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility to December 29, 2012, (ii) provide an aggregate amount of \$6 million under both facilities, with up to \$2 million available under the Second Restated Revolving Credit Facility and up to \$4 million available under the Restated Ex-Im Facility, and (iii) remove the letter of credit sub-facility from the Second Restated Revolving Credit Facility. In addition, if the Company achieves certain levels of liquidity, based on cash on hand and availability under the credit facility, the Company will have a 0.5% lower interest rate. In connection with those amendments, a guidance line has been established to support letters of credit in an aggregate amount of up to \$2.5 million through January 31, 2012, and thereafter in an aggregate amount of up to \$1.5 million through December 29, 2012. The letters of credit will be secured by the Bank's existing all asset lien. In addition, if the Company achieves certain levels of liquidity, based on cash on hand and availability under the credit facility, the Company will not be required to cash collateralize letters of credit issued under this guidance line. All other terms and conditions under the credit facilities remain the same.

Advances outstanding under the Second Restated Revolving Credit Facility were zero and \$842 thousand at December 31, 2011 and 2010, respectively. Advances outstanding under the Restated Ex-Im Facility were \$1.2 million and \$315 thousand at December 31, 2011 and 2010, respectively. As of December 31, 2011, the interest rate per annum on the Second Restated Revolving Credit Facility and Restated Ex-Im Facility was 6.5% and 6.5%, respectively. The Company has utilized \$1.4 million of the guidance line at December 31, 2011 and utilized \$1.4 million of the letter of credit sub-facility at December 31, 2010. Combined availability under the Second Restated Revolving Credit Facility and the Restated Ex-Im Facility was \$1.7 million as of December 31, 2011.

8. Stock-Based Compensation

At December 31, 2011, 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.

A summary of the activity of this plan follows:

| | Number of Shares | Weighted Average Exercise Price |
|--|---------------------|---------------------------------------|
| Options Outstanding at December 31, 2010 | 760,732 | \$6.56 |
| Granted | 40,000 | \$2.82 |
| Exercised | (2,500 |) \$3.50 |
| Forfeited | (5,125 |) \$3.51 |
| Options Outstanding at December 31, 2011 | 793,107 | \$6.40 |
| Expected to Vest at December 31, 2011 | 144,999 | \$5.50 |

| | | |
|--|---------|--------|
| Options Exercisable at December 31, 2011 | 640,982 | \$6.61 |
|--|---------|--------|

| | |
|---|---------|
| Options Available for Future Grant at December 31, 2011 | 258,800 |
|---|---------|

At December 31, 2011, the Company has outstanding under its 1996 Plan and 2007 Plan, an aggregate 243,746 non-qualified stock options held by the non-employee directors of the Company for the purchase of common stock at an average exercise price of \$6.65 per share.

In accordance with ASC 718, the Company has recognized stock-based compensation expense of \$369 thousand and \$500 thousand for the years ended December 31, 2011 and 2010, respectively. Approximately \$272 thousand and \$397 thousand of stock-based compensation expense was charged to selling, general and administrative expenses for the years ended December 31,

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2011 and 2010, respectively, and approximately \$97 thousand and \$103 thousand of stock-based compensation expense was charged to cost of sales for the years ended December 31, 2011 and 2010, respectively. No stock-based compensation expense was capitalized during 2011 and 2010. Compensation expense related to stock options to be charged in future periods amounts to approximately \$343 thousand at December 31, 2011 and will be recognized over a weighted-average period of 1.89 years as follows:

| For the years ended December 31, | Expected Compensation Expense (in thousands) |
|----------------------------------|--|
| 2012 | \$202 |
| 2013 | 105 |
| 2014 | 36 |
| | \$343 |

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, 2011 were in the following exercise price ranges:

| Range of Exercise Price | Options Outstanding | | | | Options Exercisable | | | |
|-------------------------------|------------------------------------|--|---|---------------------------------|------------------------------------|--|--|---------------------------------|
| | Number of Shares Outstanding | 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 |
| \$ 0.78 to \$ 5.80 | 394,034 | 5.79 | \$4.17 | \$— | 313,534 | 5.09 | \$4.13 | \$— |
| \$ 5.81 to \$ 10.60 | 345,948 | 6.11 | \$7.80 | — | 278,198 | 5.81 | \$8.12 | — |
| \$ 10.61 to \$ 15.40 | 38,125 | 5.75 | \$13.12 | — | 35,500 | 5.71 | \$13.15 | — |
| \$ 15.41 to \$ 15.73 | 15,000 | 6.39 | \$15.73 | — | 13,750 | 6.39 | \$15.73 | — |
| | 793,107 | | | \$— | 640,982 | | | \$— |

The aggregate intrinsic value in the table above represents the total intrinsic value, based on the Company's closing stock price of \$0.63 as of December 31, 2011, 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 \$3 thousand and \$39 thousand for the years ended December 31, 2011 and 2010, respectively. The total intrinsic value of options expected to vest at December 31, 2011 was approximately zero, and the weighted average remaining contractual life of outstanding options that are expected to vest is 7.95 years.

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The per-share weighted-average fair value of stock options granted was \$1.78 and \$2.62 for the years ended December 31, 2011 and 2010, 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 | |
|------|----------------------------|----------------------------|-------------------------|-------------------------------|---|
| 2010 | — | 1.46 | % 4.29 years | 81.1 | % |
| 2011 | — | 1.76 | % 5.09 years | 78.0 | % |

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

The Company recorded a net income tax provision of \$24 thousand and a benefit of \$154 thousand for the years ended December 31, 2011 and 2010, respectively. The Company recorded a tax benefit on the loss from continuing operations of \$890 thousand and \$1.1 million for the years ended December 31, 2011 and 2010, respectively, which was offset by a provision on the income from discontinued operations of \$914 thousand and \$992 thousand for the years ended December 31, 2011 and 2010, respectively. The discontinued operations is associated with the sale of the Company's Medical Products Business Unit. See Note 16 to the consolidated financial statements.

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(benefit) for income taxes follows:

| (in thousands) | 2011 | 2010 |
|--|-----------|-----------|
| Income tax benefit – continuing operations at statutory rate | \$(1,258) | \$(1,015) |
| Increase (decrease) in valuation allowance related to income tax expense | 600 | (335) |
| State income tax (benefit) provision | (363) | 37 |
| Permanent differences | 131 | 167 |
| Income tax benefit – continuing operations | (890) | (1,146) |
| Income tax provision – discontinued operations at statutory rate | 777 | 843 |
| State income taxes – discontinued operations | 137 | 149 |
| Income tax provision – discontinued operations | 914 | 992 |
| Total | \$24 | \$(154) |

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) | 2011 | 2010 |
|--|-------|-------|
| Deferred tax assets: | | |
| Accounts receivable | \$— | \$48 |
| Accruals | 2,028 | 2,396 |
| Inventories | 377 | 210 |
| Net operating loss carryforwards | 4,822 | 4,025 |
| General business credit carryforwards | 404 | 222 |
| Alternative minimum tax credit carryforwards | 268 | 268 |
| Foreign tax credit | 38 | 38 |
| Total gross deferred tax assets | 7,937 | 7,207 |
| Prepaid expenses | 294 | 214 |
| Depreciation | 440 | 712 |
| Amortization | 131 | — |
| Total gross deferred tax liabilities | 865 | 926 |
| Valuation allowance | 7,072 | 6,281 |
| Net deferred tax assets | \$— | \$— |

The net change in the total valuation allowance for the period ended December 31, 2011 was an increase of \$791 thousand. Federal and state net operating loss carryforwards were approximately \$14.0 million and \$9.1 million, respectively, as of December 31, 2011. The federal net operating loss carryforwards will expire at various times

starting in 2026 through 2031, if not utilized. The state net operating loss carryforwards will expire at various times starting in 2012 through 2031, if not utilized. Included in the Federal net operating loss carryforwards were 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.

The tax years of 2008 through 2011 remain open to examination by major taxing jurisdictions to which the Company is subject. In addition, because the Company has net operating loss carryforwards for the years ended December 31, 2004 through December 31, 2007, the Internal Revenue Service and the state taxing authorities are permitted to audit those earlier years and propose adjustments up to the amount of net operating loss generated. The Company is currently not under examination by the Internal Revenue Service or any other jurisdiction for any tax years. At December 31, 2011, 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 \$1.4 million at December 31, 2011 and 2010, 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 the Company does not perform as contractually required. The outstanding letters of credit were secured by \$21 thousand of restricted cash at December 31, 2011 and December 31, 2010, respectively, and the remainder was secured by the Second Restated Revolving Credit Facility.

Property Under Capital Leases and Lease Commitments

At December 31, 2011 and 2010, the Company had operating and capital leases for office space and office equipment. At December 31, 2011, future minimum lease payments for the period ended are as follows:

| (in thousands) | Unrelated Party Operating Leases | Related Party Operating Leases | Unrelated Party Capital Leases |
|---|---|--------------------------------------|--------------------------------------|
| 2012 | \$164 | \$3,591 | \$41 |
| 2013 | 129 | 3,731 | 15 |
| 2014 | — | 3,871 | 8 |
| 2015 | — | 3,478 | — |
| 2016 | — | 2,530 | — |
| 5 years and thereafter | — | 2,380 | — |
| Total minimum lease payments | \$293 | \$19,581 | 64 |
| Less: amounts represented by interest | | | (6) |
| Present value of monthly lease payments | | | 58 |
| Less: current portion of unrelated party capital lease obligation | | | (37) |
| Long-term portion of unrelated party capital lease obligation | | | \$21 |

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 \$4 thousand and \$5 thousand for the year ended December 31, 2011 and 2010, respectively. 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 \$6 thousand and \$10 thousand for the year ended December 31, 2011 and 2010, respectively. This lease was classified as a unrelated party capital lease.

The asset value of the equipment under capital lease is \$58 thousand and \$102 thousand and is recorded in property and equipment in the Company's consolidated balance sheet for the years ended December 31, 2011 and 2010, respectively.

Unrelated Party Operating Leases

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Unrelated party operating leases primarily consist of leases for servers, 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, a Trust of which Roger G. Little, Chairman of the Board, Chief Executive Officer and President of the Company, is the sole trustee and principal beneficiary, with respect to 144,230 square feet of space comprising the entire building in which the Company have occupied space since December 1, 1985. The term of the Bedford Lease commenced on December 1, 2007 and was originally set to expire on November 30, 2012. The annual rental rate for the first year of the Bedford Lease was \$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 increased on each anniversary by \$0.75 per square foot.

On September 17, 2010, the Company entered into the First Amendment to Lease Agreement with SPI-Trust to amend the Bedford Lease. The term of the Bedford Lease was extended for an additional five (5) years to expire on November 30, 2017. The annual rental rate for the first year of the extended term (December 1, 2012 through November 30, 2013) is \$16.00 per square foot on a triple net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. After the first year of the extended term of the Bedford Lease, the annual rental rate increases on each anniversary by \$0.50 per square foot. The Company has the right to further extend the term of the Bedford Lease for an additional five (5) year period. If the Company exercises this right to further extend the term of the Bedford Lease, the annual rental rate for the first year of the further 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 \$0.50 per square foot. Additionally, SPI-Trust agreed to reimburse the Company up to \$50 thousand for all costs incurred by the Company in connection with any alterations or improvements to the premises or repairs or replacements to the heating and air conditioning systems. The Company believes that the terms of the Bedford Lease, as amended, are commercially reasonable. Rent expense under the Bedford Lease was \$2.3 and \$2.1 million for the years ended December 31, 2011 and 2010, respectively.

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 was to continue for seven (7) years until August 31, 2015. 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. In addition, the Company was 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 Hudson Lease is classified as a related party operating lease. Rent expense under the Hudson Lease was \$1.3 million for the years ended December 31, 2011 and 2010, respectively. In connection with sale of the Semiconductor Business Unit, the lease was terminated on March 9, 2012 and the Company was released from all future obligations under the lease as of such date, including future rent payments of \$4.9 million. These payment obligations in the amounts of \$1.0 million, \$1.4 million, \$1.5 million and \$1.0 million would have been paid in years ended 2012, 2013, 2014 and 2015, respectively. The security deposit of \$300 thousand will be used to off-set rent payments in the first quarter of 2012. See Note 17 to the consolidated financial statements.

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 \$151 thousand and \$183 thousand for the year ended December 31, 2011 and 2010, 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 sheets 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 sheets. 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.

On November 17, 2011, the Compensation Committee of the Board of Directors of the Company approved an amendment to the Plan for the Participant to permit the Participant to elect, subject to Compensation Committee approval, to receive all or any part of the deferred portion of the Participant's compensation under the Plan in shares of the Company's common stock in lieu of cash. The number of shares to be issued in lieu of such deferred compensation shall be equal to the dollar amount that would otherwise be credited to the Plan divided by the closing sale price per share of common stock on the date on which the Compensation Committee approves the Participant's election. The shares shall be issued under, and be subject to the terms, conditions and limitations of, the Company's 2007 Stock Equity Plan (the "2007 Plan"). The Plan permits one election to be made with respect to accumulated deferred compensation for 2010 and 2011 and, commencing in 2012, elections shall be made on a quarterly basis. All such elections shall be subject to and be contingent upon approval of the Compensation Committee. On November 17, 2011, the Participant elected to receive aggregate accumulated deferred compensation of \$500,000 for 2010 and 2011 in shares of common stock (and the Compensation Committee approved such election), which, based on the closing sale price of the Company's common stock on such date (\$0.78), is equal to approximately 641,025 shares. Because of limitations on awards under the 2007 Plan, the Plan was issued 200,000 of such shares, valued at approximately \$156 thousand, in 2011. The remaining aggregate accumulated deferred compensation of \$344 thousand will be settled through the issuance of additional shares in 2012. Compensation expense was approximately \$250 thousand in the years ended December 31, 2011 and 2010, respectively. Accrued compensation expense related to the Plan was \$344 thousand and \$250 thousand at December 31, 2011 and 2010, respectively.

12. Loss Per Share

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

| | 2011 | 2010 |
|--|-----------|-----------|
| Weighted average number of common and common equivalent shares outstanding – basic | 8,386.188 | 8,341.356 |
| Add: Net additional common shares upon assumed exercise of common stock options | — | — |
| Weighted average number of common and common equivalent shares outstanding – diluted | 8,386.188 | 8,341.356 |

For the years ended December 31, 2011 and 2010, 1,950 and 18,079 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 the Company's losses.

In addition, for the years ended December 31, 2011 and 2010, 773,107 and 584,321 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.

On January 11, 2011, a civil complaint (the "Action") was filed in U.S. District Court in Massachusetts by Spire Biomedical, Inc., a wholly-owned subsidiary of the Company, against a contract manufacturer alleging breach of contract related to the manufacture of medical devices. On December 30, 2011, the Action was fully and finally settled between the parties. See Note 16 to the consolidated financial statements.

On February 4, 2011, Silicon International Ltd. ("SI") filed a complaint in Suffolk Superior Court in Massachusetts, and on February 11, 2011 served a summons, against the Company alleging breach of contract related to SI's activities acting as a

former sales and service representative of the Company within China. The complaint makes claims regarding amounts allegedly owed to SI by the Company, specifically with regard to allegedly owed commissions. SI is seeking an accounting for all money allegedly owed to it, including double or triple damages. The Company filed its answer and counterclaims against SI on February 24, 2011, denying SI's allegations, and claiming that SI interfered in the Company's business relationships and generally engaged in multiple breaches of contract against the Company. The Company is seeking double or triple damages.

The Company is not aware of any other 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 | Opto-electronics | Corporate | Total Company |
|--|----------------|---------------------|------------------|-----------|------------------|
| December 31, 2011 | | | | | |
| Net sales and revenues | \$50,957 | \$7,785 | \$ 2,816 | \$— | \$61,558 |
| Operating income (loss) from continuing operations | (1,875) | 1,561 | (3,298) | — | (3,612) |
| Identifiable assets | 11,229 | 1,853 | 2,671 | 8,425 | 24,178 |
| Capital expenditures | 90 | — | 82 | 107 | 279 |
| Depreciation and amortization | 355 | 376 | 775 | 328 | 1,834 |
| Stock-based compensation | 129 | 45 | 24 | 171 | 369 |
| December 31, 2010 | | | | | |
| Net sales and revenues | \$66,858 | \$8,341 | \$ 4,643 | \$— | \$79,842 |
| Operating income (loss) from continuing operations | (2,029) | 1,325 | (2,131) | — | (2,835) |
| Identifiable assets | 18,515 | 2,351 | 3,498 | 10,221 | 34,585 |
| Capital expenditures | 29 | 206 | 385 | 197 | 817 |
| Depreciation and amortization | 357 | 210 | 735 | 387 | 1,689 |
| Stock-based compensation | 133 | 63 | 38 | 266 | 500 |

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

| (in thousands) | 2011 | % | 2010 | % | |
|-------------------|----------|-----|------------|-----|---|
| United States | \$31,890 | 52 | % \$48,793 | 61 | % |
| Europe/N. Africa | 5,744 | 9 | % 14,763 | 19 | % |
| Asia | 21,777 | 35 | % 16,233 | 20 | % |
| Rest of the world | 2,147 | 4 | % 53 | — | % |
| | \$61,558 | 100 | % \$79,842 | 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 surface treatments and biophotonics research) and, until its sale on March 9, 2012, optoelectronics (comprised primarily of Spire Semiconductor). Spire Solar and Spire Biomedical operate out of the Company's facility in Bedford, Massachusetts. Spire Semiconductor operated 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 March 9, 2012, the Company completed the sale of the Semiconductor Business Unit to Masimo Corporation. See Note

17 to the consolidated financial statements.

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 16 to the consolidated financial statements.

Operating income (loss) from continuing operations is net sales less cost of sales, selling, general and administrative expenses and gain on termination of contracts, but is not affected by non-operating income (expense), by income taxes or by net income from discontinued operations. In calculating operating income (loss) from continuing 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 2011 and 2010 were approximately \$8.8 million and \$25.7 million, or 14% and 32% of consolidated net sales and revenues, respectively.

Revenues from the delivery of solar equipment to Servo Dynamics Co., Ltd. and First Solar, Inc. accounted for 15% and 10%, respectively, of total net sales and revenues for 2011. Revenues from the delivery of a solar photovoltaic system to PPS Berkshire Solar LLC accounted for 13% of total net sales and revenues for 2011. Revenues from the delivery of solar equipment and recurring revenues from the sale of solar cell materials to Federal Prison Industries, Inc. accounted for 1% and 12%, respectively, of total net sales and revenues for 2011.

Revenues from the delivery of a solar equipment cell line and solar equipment module line to Solaria Energia accounted for 10% and 5%, respectively, of total net sales and revenues for 2010. Revenues from the delivery of solar equipment and recurring revenues from the sale of solar cell materials to Federal Prison Industries, Inc. accounted for 7% and 21%, respectively, of total net sales and revenues for 2010.

Three customers represented approximately 19%, 12% and 10% of net accounts receivable, trade at December 31, 2011 and two customers represented approximately 16% and 12% of net accounts receivable, trade at December 31, 2010.

Republic of Singapore was the only foreign country that accounted for more than 10% of sales in 2011 and Spain and China were the only foreign countries that accounted for more than 10% of sales in 2010. Net sales to customers in Republic of Singapore accounted for \$8.2 million in 2011 and net sales to customers in Spain and China accounted for \$11.6 million and \$8.6 million, respectively, in 2010.

15. Gain on Termination of Contracts

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 in the fourth quarter of 2009 and first quarter of 2010. As a result of the settlement agreement entered into in the first quarter of 2010 and deposits paid by Jiangxi less settlements paid to vendors, the Company recognized a gain on termination of contracts of \$837 thousand in the first quarter of 2010.

In the fourth quarter of 2010, the Company determined that a sale agreement with Zhejiang LeYe Photovoltaic Science & Technology Co., Ltd. ("LeYe") related to solar equipment was terminated due to a breach of contract by LeYe. LeYe had failed to make payments as required by the agreement and has not responded to numerous communications by the Company. In the fourth quarter of 2010, the Company recognized a gain on termination of contracts of \$51 thousand which relates to LeYe's non-refundable deposit.

On August 26, 2009, the Company 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. In addition, on August 26, 2009, the Company 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. Finally, concurrently with the execution of the Cell Line Agreement and the Module Line Agreement, the Company entered into a Project Management Agreement for Utilities & Infrastructure Supply for Spire Cell and Module Line (the "Project Management Agreement") under which the

Company 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 have been \$11.5 million which would have been paid over time as the services were provided.

Under an amended Memorandum of Agreement ("MOA"), Uni-Chem was to make a \$2.0 million non-refundable deposit to the Company creditable towards the Module Line Agreement if Uni-Chem made all initial down payments under the three projects noted above. Uni-Chem paid \$1.0 million of this deposit. The remaining \$1.0 million deposit and the associated deposits for the three projects noted above were not paid. On November 24, 2009, the MOA terminated as scheduled 90 days from execution. In 2010, Uni-Chem communicated that it possessed no further intent to provide the Company with any scheduled payments for the Cell Line or Module Line. On November 30, 2010, the Company delivered to Uni-Chem a notice stating this matter was closed and that the Company has retained Uni-Chem's non-refundable deposit. In the fourth quarter of 2010, the Company recognized a gain on termination of contracts of \$1.0 million which relates to Uni-Chem's non-refundable deposit.

In the fourth quarter of 2011, the Company determined that a purchase and sale agreement with Genus Innovation Ltd. ("Genus") related to a module manufacturing line was terminated due to a breach of contract by Genus. Genus had failed to take delivery of equipment and make payments as required by the agreement. In the third quarter of 2011, the Company formally notified Genus that they were in breach of the agreement and provided Genus until October 30, 2011 to cure the breach. Genus failed to cure the breach as required by the agreement and the Company sent Genus formal notification on October 31, 2011 that the agreement was terminated. In the fourth quarter of 2011, the Company recognized a gain on termination of contracts of \$409 thousand which relates to Genus' non-refundable deposit.

16. Discontinued Operations and Assets Held for Sale

In accordance with ASC 205-20, Presentation of Financial Statements - Discontinued Operations, the accompanying unaudited condensed 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 purchase price for the Medical Products Business Unit was \$12.4 million, including (i) \$9.4 million that was paid in cash to the Company at closing, (ii) \$100 thousand that was paid in cash 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) \$2.9 million that was paid in cash to the Company in the second quarter of 2010 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") were transferred to Bard upon the completion of a product recall related to such assets, which occurred in the second quarter of 2010. Until the Contingent Deferred Assets were transferred by the Company, it continued to manufacture and supply to Bard certain hemodialysis catheter products under the terms of a distribution agreement (the "Transition

Period”). The Contingent Deferred Assets were transferred to Bard and Bard paid \$1.5 million of the Contingent Purchase Price to the Company in the second quarter of 2010. In addition, Bard paid \$1.4 million of the remaining Contingent Purchase Price to the Company in the second quarter of 2010 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 was equal to the Company's 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. 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. The U.S. Food and Drug Administration advised the Company in June 2010 that the recalls were

terminated. 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 \$162 thousand for the twelve months ended December 31, 2010.

During the fourth quarter of 2011, the Company received a cash payment of \$2.5 million in settlement of a breach of contract dispute with a contract manufacturer and recorded a net gain on legal settlement of \$2.3 million in the same quarter. This amount has been recorded as a component of net income from discontinued operations.

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.

There were no assets of the Medical Products Business Unit as of December 31, 2011 and 2010. The liabilities of the Medical Products Business Unit as of December 31, 2011 and 2010 are as follows:

| (in thousands) | December 31, 2011 | December 31, 2010 |
|--|----------------------|----------------------|
| Liabilities of Discontinued Operations | | |
| Current liabilities of discontinued operations | | |
| Accounts payable | \$94 | \$257 |
| Accrued liabilities | 23 | 109 |
| Total current liabilities of discontinued operations | 117 | 366 |
| Total liabilities of discontinued operations | \$117 | \$366 |

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

| (in thousands) | Year Ended December 31, | |
|--|-------------------------|----------|
| | 2011 | 2010 |
| Net sales and revenues | \$— | \$1,656 |
| Gross margin | \$— | \$(136) |
| Loss from discontinued operations before sale of business unit | \$— | \$(123) |
| Gain on sale of business unit, net of transaction expenses | — | 2,604 |
| Gain on legal settlement, net of transaction expenses | 2,286 | — |
| Income tax provision | (914 |) (992) |
| Net income from discontinued operations, net of tax | \$1,372 | \$1,489 |

17. Sale of Semiconductor Business Unit

During the first quarter of 2012, the Company began pursuing an exclusive sales process of the Company's Semiconductor Business Unit and on March 9, 2012, the Company completed the sale of the Semiconductor Business Unit to Masimo Corporation. The asset purchase agreement provided that the aggregate purchase price for the Semiconductor Business Unit was \$8.0 million plus the assumption of \$500 thousand in liabilities, with the cash portion of the purchase price being reduced by retained cash and liabilities assumed by Masimo in excess of \$500 thousand. As a result, on the closing date the Company received approximately \$7.2 million in cash (less the escrow described below) and Masimo assumed approximately \$1.2 million in liabilities. The purchase price is subject to post-closing adjustments based on the balance sheet of the business as of the closing date. Of the purchase price,

approximately \$717 thousand was deposited into an indemnity escrow account for fifteen months to partially secure the Company's obligations for any indemnity claims under the asset purchase agreement. In connection with this transaction, the lease for the premises in Hudson, New Hampshire where the Semiconductor Business Unit was located was terminated on March 9, 2012, and the Company was released from all future obligations under the lease as of such date.

18. Subsequent Events

The Company evaluated subsequent events through the date of this filing. Except as disclosed in Note 17, there were no

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other material events that impacted the consolidated financial statements or disclosures.

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

None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

As of the end of the period covered by this report, an evaluation of the effectiveness of the design and operation of the our disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")) was performed under the supervision and with the participation of management, including our Chief Executive Officer and Chief Financial Officer. Based on that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective as of December 31, 2011 to ensure that information required to be disclosed in the reports it files and submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and that information required to be disclosed under the Exchange Act is accumulated and communicated to management, including our Chief Executive Officer and our Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

Management's Report on Internal Control over Financial Reporting

Our Company's management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f). Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of our consolidated financial statements for external purposes in accordance with generally accepted accounting principles. Under the supervision and with the participation of our Company's management, including the Chief Executive Officer and Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 13, 2011 based on the framework in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission.

Our internal control over financial reporting includes those policies and procedures that: (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of our consolidated financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our consolidated financial statements.

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

Based on our evaluation under the framework in Internal Control—Integrated Framework, the management of our Company concluded that our internal control over financial reporting was effective as of December 31, 2011.

McGladrey & Pullen, LLP, our registered independent public accounting firm, was not required to and has not issued a report concerning the effectiveness of our internal control over financial reporting as of December 31, 2011.

Changes in Internal Control Over Financial Reporting

During the quarter ended December 31, 2011, we improved on our previously disclosed material weakness related to the deferred tax analysis and related disclosures. Additionally, we retained new software services that improved our previously disclosed significant deficiencies in our internal control over financial reporting. Based on these improvements and our evaluation under the framework in Internal Control—Integrated Framework, the management of our Company concluded that our internal control over financial reporting became effective during the quarter ended December 31, 2011.

Except as noted above, there were no other changes in our internal control over financial reporting that occurred during the quarter ended December 31, 2011 that have materially affected, or are reasonably likely to affect, our internal control over financial reporting.

Item 9B. Other Information

None

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 2012 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.

- 2.1 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. +
- 2.2 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.
- 2.3 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.
- 2.4 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.
- 2.5 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. +
- 3.1 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.
- 3.2 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.
- 10.1 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").
- 10.2 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.
- 10.3 Non-Qualified Deferred Compensation Plan for Roger Little (Amended and Restated Effective as of November 17, 2011), incorporated by reference to Exhibit 10.41 to the Company's Form 8-K filed with the SEC on November 22, 2011.
- 10.4 Spire Corporation 1996 Equity Incentive Plan, incorporated by reference to Appendix A to the Company's Proxy Statement dated April 15, 2004.
- 10.5 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.
- 10.6 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").
- 10.7 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").
- 10.8 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.
- 10.9 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.
- 10.10 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.

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- 10.11 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.
- 10.12 First Amendment to Lease Agreement, dated September 17, 2010, 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(ay) to the Company's Form 8-K filed with the SEC on September 22, 2010.
- 10.13 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.
- 10.14 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.

- 10.15 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.
- 10.16 Second Amended and Restated Loan and Security Agreement, dated November 16, 2009, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(au) to the Company's 2010 Form 10-Q for the quarter ended March 31, 2010.
- 10.17 Amended and Restated Export-Import Bank Loan and Security Agreement, dated November 16, 2009, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(av) to the Company's 2010 Form 10-Q for the quarter ended March 31, 2010.
- 10.18 First Loan Modification Agreement (Domestic), dated June 15, 2010, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(aw) to the Company's 2010 Form 10-Q for the quarter ended June 30, 2010.
- 10.19 First Loan Modification Agreement (Exim), dated June 15, 2010, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(ax) to the Company's 2010 Form 10-Q for the quarter ended June 30, 2010.
- 10.20 Second Loan Modification Agreement (Domestic), dated November 8, 2011, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank (filed herewith).
- 10.21 Second Loan Modification Agreement (Exim), dated November 8, 2011, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank (filed herewith).
- 10.22 Third Loan Modification Agreement (Domestic), dated December 30, 2011, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank (filed herewith).
- 10.23 Third Loan Modification Agreement (Exim), dated December 30, 2011, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank (filed herewith).
- 10.24 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. *
- 10.25 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. *
- 10.26 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. *
- 10.27 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 2008 Form 10-K/A for the year ended December 31, 2008. *
- 10.28 Amendment of Solicitation/Modification of Contract MOD04 to Solicitation/Contract/Order for Commercial Items, dated January 8, 2010, by and between Spire Corporation and Federal Prison Industries, UNICOR, incorporated by reference to Exhibit 10(at) to the Company's 2010 Form 10-Q for the quarter ended March 31, 2010.*

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- 10.29 Amendment of Solicitation/Modification of Contract MOD05 to Solicitation/Contract/Order for Commercial Items, with an effective date of June 15, 2010, by and between Spire Corporation and Federal Prison Industries, UNICOR, incorporated by reference to Exhibit 10(az) to the Company's 2010 Form 10-Q for the quarter ended September 30, 2010.*
- 10.30 Amendment of Solicitation/Modification of Contract MOD06 to Solicitation/Contract/Order for Commercial Items, with an effective date of October 01, 2010, by and between Spire Corporation and Federal Prison Industries, UNICOR, incorporated by reference to Exhibit 10(aaa) to the Company's 2010 Form 10-Q for the quarter ended September 30, 2010.*
- 10.31 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.
- 10.32 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. *
- 10.33 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. *

- 10.34 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.
- 10.35 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.
- 10.36 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.
- 10.37 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.
- 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.
- 23.1 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).
- 32.2 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).
- 101.INS XBRL Instance Document **
- 101.SCH XBRL Taxonomy Extension Schema Document **
- 101.CAL XBRL Taxonomy Extension Calculation Linkbase Document **
- 101.DEF XBRL Taxonomy Extension Definition Linkbase Document **
- 101.LAB XBRL Taxonomy Extension Lable Linkbase Document **
- 101.PRE XBRL Taxonomy Extension Presentation Linkbase Document **

- * Portions of this Exhibit have been omitted pursuant to a grant of confidential treatment. Pursuant to Rule 406T of Regulation S-T, the Interactive Data Files on Exhibit 101 hereto are deemed not filed or
- ** part of a registration statement or prospectus for purposes of Sections 11 or 12 of the Securities Act of 1933, as amended, are deemed not filed for purposes of Section 18 of the Securities and Exchange Act of 1934, as amended, and otherwise are not subject to liability under those sections.
- + 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 15, 2012

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 Roger G. Little | Chairman of the Board, Chief Executive Officer and President (Principal Executive Officer) | March 15, 2012 |
| /s/ Robert S. Lieberman Robert S. Lieberman | Chief Financial Officer and Treasurer (Principal Financial Officer and Principal Accounting Officer) | March 15, 2012 |
| /s/ Udo Henseler Udo Henseler | Director | March 15, 2012 |
| /s/ David R. Lipinski David R. Lipinski | Director | March 15, 2012 |
| /s/ Mark C. Little Mark C. Little | Chief Executive Officer, Spire Biomedical and Director | March 15, 2012 |
| /s/ Michael J. Magliochetti Michael J. Magliochetti | Director | March 15, 2012 |
| /s/ Guy L. Mayer Guy L. Mayer | Director | March 15, 2012 |
| /s/ Roger W. Redmond Roger W. Redmond | Director | March 15, 2012 |

EXHIBIT INDEX

| Exhibit | Description |
|---------|---|
| 10.20 | Second Loan Modification Agreement (Domestic), dated November 8, 2011, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank (filed herewith). |
| 10.21 | Second Loan Modification Agreement (Exim), dated November 8, 2011, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank (filed herewith). |
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| 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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| 101.INS | XBRL Instance Document ** |
| 101.SCH | XBRL Taxonomy Extension Schema Document ** |
| 101.CAL | XBRL Taxonomy Extension Calculation Linkbase Document ** |
| 101.DEF | XBRL Taxonomy Extension Definition Linkbase Document ** |
| 101.LAB | XBRL Taxonomy Extension Label Linkbase Document ** |
| 101.PRE | XBRL Taxonomy Extension Presentation Linkbase Document ** |

Pursuant to Rule 406T of Regulation S-T, the Interactive Data Files on Exhibit 101 hereto are deemed not filed or part of a registration statement or prospectus for purposes of Sections 11 or 12 of the Securities Act of 1933, as amended, are deemed not filed for purposes of Section 18 of the Securities and Exchange Act of 1934, as amended, and otherwise are not subject to liability under those sections.