

SPIRE CORP
Form 10KSB
March 30, 2004
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-KSB

x Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

For the fiscal year ended December 31, 2003 or

.. Transition Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

For the transition period from _____ to _____

Commission file number: 0-12742

Spire Corporation

(Name of small business issuer as specified in its charter)

Massachusetts
(State or other jurisdiction of incorporation or organization)

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

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

01730-2396
(Zip code)

(781) 275-6000

(Issuer's telephone number, including area code)

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

Common Stock, \$0.01 par value; Registered on The Nasdaq Stock Market

(Title of class)

Check whether the issuer: (1) filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the past 12 months (or for such shorter period that the issuer was required to file such reports); and (2) has been subject to such filing requirements for the past 90 days. Yes No

Check if there is no disclosure of delinquent filers in response to Item 405 of Regulation S-B contained in this form, and no disclosure will be contained, to the best of issuer's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-KSB or any amendment to this Form 10-KSB

The issuer's revenues for its most recent fiscal year: \$15,803,000.

The aggregate market value of the voting stock held by non-affiliates of the issuer based on the last sale price of such stock as reported by The Nasdaq Stock Market on March 1, 2004, was approximately \$19,233,188.

The number of shares outstanding of the issuer's common stock, as of March 1, 2004, was 6,765,660.

Transitional Small Business Disclosure Format (Check One): Yes No

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive proxy statement for the Special Meeting in Lieu of 2004 Annual Meeting of Stockholders to be held on May 19, 2004, are incorporated by reference in Part III of this Report.

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For the Year Ended December 31, 2003

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FORWARD-LOOKING STATEMENTS

This report contains forward-looking statements that 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 expects, anticipates, intends, plans and similar expressions. Our actual results could differ materially from those discussed in these statements. Factors that could contribute to these differences include those discussed under Risk Factors, Management's Discussion and Analysis of Financial Condition and Results of Operations, and elsewhere in this report. The cautionary statements made in this report should be read as being applicable to all forward-looking statements wherever they appear in this report.

PART I

Item 1. Description of 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 National Market under the symbol SPIR .

On May 23, 2003, the Company acquired from Stratos Lightwave, Inc. all of the ownership interests of Bandwidth Semiconductor, LLC, a Delaware limited liability company, located in Hudson, New Hampshire. Bandwidth is a compound semiconductor foundry providing material and device fabrication services to defense, telecommunications and biomedical instrument industries.

In October 15, 2002, the Company sold an exclusive patent license for a hemodialysis split-tip catheter to Bard Access Systems, Inc., a wholly owned subsidiary of C. R. Bard, Inc., in exchange for a first payment upon the execution of the agreement and three subsequent payments each due upon the achievement of certain additional milestones by Bard Access Systems. In June 2003, the Company received the second payment under the purchase contract upon the attainment of the first milestone, namely the first commercial sale by Bard Access Systems of a licensed product. In conjunction with the sale, the Company received a sublicense, which permits the Company to continue to manufacture and market hemodialysis catheters for the treatment of chronic kidney disease. In addition, the Company granted Bard Access Systems a right of first refusal should the Company seek to sell the catheter business.

In 2002, the Company, through its business unit Spire Solar Chicago, began module production at its new facility in the Chicago Center for Green Technology, after operating for two years in temporary space. The agreement with the City of Chicago, Illinois (the City) and Commonwealth Edison (ComEd), a subsidiary of Exelon Corporation, as amended and extended to December 15, 2003, specified the terms under which the City would purchase solar electric systems from the Company, up to a maximum dollar amount. The agreement with ComEd, as amended and extended to December 31, 2004, obligates ComEd to make incentive payments to the Company for solar electric systems manufactured, assembled and delivered by the Company in the City, up to specified annual amounts. The amended agreement with ComEd also sets forth the terms under which ComEd may purchase solar electric systems from the Company. Purchasers of the Company's systems have received a subsidy from the State of Illinois of up to 60%. In 2003, the Company also amended its business agreement with BP Solar (a British Petroleum Company) under which BP Solar supplies components for solar systems and invested in certain capital equipment for the Chicago business.

Principal Products and Services

Overview

The Company develops, manufactures and markets highly-engineered products and services in four principal business areas: biomedical, solar equipment, solar systems and optoelectronics, generally bringing to bear expertise in materials technologies, surface science and thin films across all four business areas. In some cases, such as IONGUARD® processing of orthopedic devices, commercial services are well established, while in other cases, commercialization is just beginning.

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; develops and markets hemodialysis catheters and related devices for the treatment of chronic kidney disease and performs sponsored research programs into practical applications of advanced biomedical and biophotonic technologies.

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In the solar equipment area, the Company develops, manufactures and markets specialized equipment for the production of terrestrial photovoltaic modules from solar cells. The Company's equipment has been installed in more than 150 factories in 42 countries.

The Company also manufactures and markets solar photovoltaic systems suitable both for stand-alone emergency power back-up and for interconnection into the electric power grid.

In the optoelectronics area, the Company provides custom compound semiconductor and thin film wafer and device fabrication services to customers in communications, biomedical and aerospace-defense industries.

Spire Biomedical

Spire Biomedical is both a manufacturer of medical devices and a provider of advanced medical device surface treatment processes. Spire Biomedical's medical device business develops, manufactures, and sells premium products for vascular access in chronic kidney disease patients. Spire Biomedical's surface treatment business modifies the surfaces of medical devices to improve their performance.

Spire Biomedical's line of long-term hemodialysis catheters combines the highest-level performance with increased catheter placement options. The Company's proprietary catheter products provide higher flow at lower pressures and superior kink-resistance. Its patented separated distal tip design minimizes recirculation and provides a wider margin of functionality compared to conventional staggered tip designs. The Company believes that these key features present the renal care community with attractive value and performance for patient care.

The Company offers its medical customers a family of process services utilizing ion beam technologies to enhance both the surface characteristics and the performance of medical devices. The Company's advanced surface modification technology services employ proprietary Ion Implantation and Ion Beam Assisted Deposition (IBAD) techniques to improve the performance of medical components. Spire's customized surface treatments meet a variety of needs, including reduced friction, wear and abrasion, infection resistance, enhanced tissue and bone growth, increased thromboresistance, conductivity, improved radiopacity and the improvement of other performance characteristics. Spire-treated products currently include orthopedic prostheses (such as replacement hips, knees, elbows), catheters, guidewires, ear-nose-throat devices, stents, and other specialty medical devices.

Solar Equipment

Solar photovoltaics, the direct conversion of sunlight into electricity, is an important source of distributed power that can be employed locally or connected to a power grid. Spire believes that it is the world's leading supplier of the manufacturing equipment and technology needed to manufacture solar photovoltaic power systems. Spire's individual items of manufacturing equipment and its SPI-LINE^M integrated turn-key production lines are designed to meet the needs of a broad range of customers ranging from small manufactures relying on mostly manual processes to the largest photovoltaic manufacturing companies in the world.

Spire equipment spans the full process for fabricating photovoltaic modules:

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Sorting solar cells into performance groups (current groups at load voltage);

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;

Inspecting and electrically testing the module circuit by measuring its dark current versus voltage characteristics;

Washing, rinsing, and drying the glass superstrate;

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 voltage isolation between the cell circuit and the module frame;

Electrically testing the module performance by measuring a current-voltage curve under simulated sunlight; and

Visually inspecting the completed module for quality of materials and workmanship.

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

Spire Solar Chicago

Spire Solar Chicago is the principal business unit of the Company's solar systems business segment. Spire Solar Chicago provides clients in the Chicago metropolitan area with grid-connected distributed photovoltaic (PV) systems to meet their demand for solar electricity. The business is a vertically integrated manufacturing and system design company whose team of experienced professionals offers complete project management, installation, and customer service.

Through collaboration with the City of Chicago Department of Environment and ComEd, Spire Solar Chicago has developed approximately \$8 million in PV systems. In addition, the State of Illinois has a renewable energy subsidy program that funds up to 60% of the total cost for an installed PV system. Spire Solar Chicago provides its customers with grant application services, as well as utility interconnect service, to take advantage of this subsidy program. Spire Solar Chicago has a business partnership with BP Solar for acquisition of manufacturing materials and has assisted BP Solar in its local systems design. Spire Solar Chicago also utilizes the products and services of many Chicago area suppliers and contractors. Local inspectors and electricians have been trained through special PV code workshops to increase their knowledge and opportunities in the field.

Bandwidth Semiconductor

Bandwidth Semiconductor, the principal business unit of the Company's optoelectronics business segment, operates in a new state-of-the-art semiconductor foundry and fabrication facility in Hudson, New Hampshire equipped with the most advanced and sophisticated metal-organic chemical vapor deposition (MOCVD) and fabrication equipment. Our fabrication facility has been designed to have the flexibility to engage in quick-turn research and prototyping as well as for economical full-rate volume production services in three primary areas: MOCVD epitaxial wafers, device foundry services, and thin film circuits.

Our MOCVD epitaxial wafer services include a wide range of compound semiconductor (chiefly gallium arsenide and indium phosphide-based compounds) epitaxial structures fabricated to our customers' designs or in some cases to our own designs. We recognize that time-to-market is critical to our customers' success, so we strive to provide the fastest turnaround times possible. Bandwidth Semiconductor has a number of standard structures available to meet many device needs and speed prototype development. Our epitaxial engineers work closely with customers to develop and improve proprietary structures for specific applications. Typical applications include: Vertical Cavity Surface Emitting Lasers (VCSEL), optical waveguides, high power edge emitting lasers, photocathodes, high electron mobility transistors (HEMT), field effect transistors (FET), PIN photodetectors, avalanche photo-detectors (APD) and other gallium arsenide-on-Silicon, lattice mismatched indium gallium arsenide photodetectors, strained quantum well and other compound semiconductor material structures.

Our foundry services can take compound semiconductor wafers up to 4 inches in diameter through processing, on-wafer test, and die separation. We can use customer-supplied photomasks or develop a new set of masks for an entire process sequence. We design the process steps and conditions to meet the desired device characteristics and implement the process in our fabrication facility, saving our customers development time and providing a source of proprietary devices without the expense of a dedicated internal fab. Typical OEM devices we have fabricated include single-element photodetectors, photodetector arrays, VCSELs, edge-emitting lasers, thermo-photovoltaic (TPV) cells and communications-quality light emitting diodes (LED).

Our thin film circuit services include the fabrication of custom structures, chip resistors and resistor arrays to customer orders using thin film technology on alumina ceramic, aluminum nitride, ferrite, glass, quartz, sapphire and silicon substrates using a variety of metals and alloys.

Principal Distribution Methods

The Company's products and services are sold primarily by its direct, internal sales staff with three notable exceptions: in certain offshore markets, the Company's solar equipment is sold via independent sales representatives, the Company's hemodialysis catheter products are sold via independent distributors, and proposals for sponsored research and development work are prepared by the Company's scientists and researchers.

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Competitive Conditions

The markets in which the Company operates are highly competitive and characterized by changes due to technological improvements and developments. The Company competes with many other manufacturers and service providers in each of its product and service areas; many of these competitors have greater resources and sales. Additionally, the Company's products and services compete with products and services utilizing alternative technologies. For example, the Company's solar photovoltaic systems compete with other forms of renewable energy such as wind, solar thermal, and geo-thermal. Price, service and product performance are significant elements of competition in the sale of each of the Company's products. The Company believes that there are considerable barriers to entry into the markets it serves, 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 the Company include polymer extrusions, molded plastic parts, silicon photovoltaic cells, compound semiconductor wafer substrates, high purity industrial gases, custom metal welded structures, fasteners, position sensors, electrical motors, electrical power conditioning inverters, and electrical controls. All of these items are available from several suppliers and the Company generally relies on more than one supplier for each item.

Sources and Availability of Manufacturing Services

The Company employs an outsourcing-model supply chain in its biomedical products business by which certain manufacturing services, such as polymer extrusion, assembly, packaging and sterilization; are obtained from third party contractors. The Company has identified multiple potential sources for the services it requires, however, certain elements of the supply chain currently involve only one qualified contractor. As sales volume expands, the Company plans to reassess its supply chain to eliminate potential bottlenecks and reduce dependence on sole-source, single site contract services.

Dependence on Major Customers

During the year ended December 31, 2003, sales of solar systems to the City of Chicago and ComEd and sales of biomedical services to Howmedica, Inc. were each 10% or more of consolidated net sales and revenues and, in the aggregate, amounted to approximately 26% of consolidated net sales.

Key Licenses and Patents, Government Rights to Intellectual Property

In October 2002, the Company sold an exclusive patent license for its hemodialysis split-tip catheter to Bard Access Systems, Inc. (Bard), a wholly owned subsidiary of C.R. Bard, Inc., in exchange for \$5 million upon the execution of the agreement, with another \$5 million due upon the attainment of certain milestones no later than 18 months after signing, and a total of \$6 million upon achievement of certain milestones by

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Bard through 2005. In addition, the Company received a sublicense that permits the Company to continue to manufacture and market hemodialysis catheters for the treatment of chronic kidney disease.

Through over 30 years of research and development, the Company has accumulated extensive scientific and technological expertise. The Company protects its technological advances as trade secrets, in part through confidentiality agreements with employees, consultants and third parties. The Company also seeks and enforces patents as appropriate. The Company currently has 40 issued United States patents, one of which is jointly owned, five patents pending in the United States, six foreign patents and six foreign patents pending, all of which cover elements of its 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 the Company does not seek and obtain a patent, and may require the Company 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, the Company's United States government contracts prohibit the Company 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.

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Government Regulation of Medical Products

The Company's hemodialysis catheters and accessory products require the approval of the United States Food & Drug Administration (FDA) prior to sale within the United States. Sales within the European Union (EU) require the CE Mark certification and sales within Canada require approval from the Medical Device Bureau of Canada.

Within the United States, the process requires that a pre-market notification (the 510(k) Submission) be made to the FDA to demonstrate that the device is as safe and effective, substantially equivalent to a legally marketed device that is not subject to pre-market approval. Applicants must compare this device to one or more similar devices commercially available in the United States, known as the predicate device(s), and make and support their substantial equivalency claims. Applicants must submit descriptive data and, when necessary, performance data to establish that the device is substantially equivalent to a predicate device. In some instances, data from human clinical trials must also be submitted in support of a 510(k) Submission. If so, the data must be collected in a manner that conforms to specific requirements in accordance with federal regulations. The FDA must issue an order finding substantial equivalence before commercial distribution can occur. This process can be lengthy and there can be no assurance that a particular product proposal will be approved.

The Company currently holds all required approvals and certifications to market its hemodialysis catheters and accessory products in the USA, EU and Canada. The Company is committed to maintaining these critical approvals and certifications and the stringent quality requirements applicable to the development, testing, manufacturing, labeling, marketing and distribution of these products.

Government Regulation of Contracts

The Company's 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 the Company's business, as well as to work performed for the Company by any subcontractors. The Company believes that it has put in place systems and personnel to ensure compliance with all such federal regulations and oversight requirements.

Research and Development

The Company's policy is to support as much of its research and development as possible through government contract funding, which it recognizes as revenue. Revenues from the Company's research and development contracts funded by the United States government, and their percent of consolidated net sales and revenues were \$2,393,000, or 15%, \$2,482,000, or 17%, and \$1,985,000, or 14%, for the years ended December 31, 2003, 2002 and 2001, respectively. All contracts with United States government agencies have been audited by the government through December 2000. The governmental audits for the years ended December 31, 2001 through December 31, 2003 have not yet been performed.

The Company's contracts with the United States government grant to the Company 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 obtain the patent on any inventions made under these contracts as to which patent protection is not sought and obtained by the Company. The Company's rights to technology developed under contracts with private companies vary, depending upon negotiated terms.

The Company's internally funded research and development expenditures were \$1,087,000, \$337,000 and \$703,000 for the years ended 2003, 2002 and 2001, respectively.

Environmental Quality

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

Employees

At December 31, 2003, the Company had approximately 113 employees, of whom 111 worked full time. The Company also from time to time employs part-time employees and hires independent contractors. The Company's employees are not represented by any collective bargaining agreement, and the Company has never experienced a work stoppage. The Company believes that its employee relations are good.

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Risk Factors

In addition to the other information in this Form 10-KSB, the following risk factors inherent in and affecting the business of the Company should be considered. The descriptions in this Form 10-KSB contain forward-looking statements that involve risks and uncertainties. The Company's 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.

Overview

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 representative 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, will continue to be successful in identifying, developing and marketing new products or enhancing its existing products, or that products or technologies developed by others will not render our products or technologies non-competitive or obsolete.

We have experienced losses from operations, before the sale of a technology license, for several quarters, and we expect that our operating results will fluctuate in the future.

We have experienced losses from operations, before the sale of a technology license, in each of the past three full years. While our revenues have improved steadily since fiscal 2000, they are still not sufficient to cover our operating expenses, and we anticipate that we may sustain future losses from operations as a result. 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:

Delays, postponements or cancellations of orders and shipments of our products, particularly in our solar equipment and solar systems businesses where individual order sizes may be large and thus may represent a significant portion of annual revenue;

Changes in our receipt of license fees, milestone payments, and royalty payments relating to our intellectual property, some receipts of which are based on the attainment of milestones and licensee sales that are beyond our control;

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;

Delays in introducing and gaining physician acceptance for new products and product improvements, particularly in our biomedical products business;

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Disruption in the distributor sales channels by which we bring our biomedical products to market;

Variation in capacity, capacity utilization and manufacturing yields within the third party medical contract manufacturing service providers that constitute the supply chain for our biomedical products that, in turn, cause variation in our ability to timely ship our products;

Increased competition from current and future competitors; and

Variation in the timing of customer orders and inventory levels at our customers, particularly within our biomedical manufacturing services business.

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.

Our ability to expand revenue and sustain profitability depends substantially on the stability and growth of the various markets for our products and services. Should we be unable to expand our revenue, our ability to reach and sustain profitability would be impaired.

The world demand for photovoltaic manufacturing equipment depends on sustained expansion in the demand for decentralized power sources, especially in developing countries, and on domestic and foreign government funding of initiatives to invest in solar energy as an alternative to the burning of fossil fuels and other energy production methods. There can be no assurance that government funding for such initiatives will be available, or that solar energy will prove to be a cost-effective alternative to other energy sources and thus gain acceptance where

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traditional energy sources continue to be available. Should demand for solar photovoltaic power sources not increase, demand for new photovoltaic manufacturing equipment would not materialize and our business would be adversely effected.

Most of our research and development revenues are generated by contracts with the United States government. There can be no assurance that the United States government will fund our research and development projects at the same level as it has in the past. Should federal research funding priorities change, and should we be unable to adjust our research focus to reflect the shift, our business could be adversely affected.

Our solar systems business unit is dependent on continued and increased order activity from the City of Chicago government and from the local electric utility, coupled with the development of other industrial and residential sales opportunities. Should we be unable to capture a significant stream of new solar system installation projects from a more diverse group of project sponsors, our solar systems business could be adversely affected.

The growth of our biomedical products business depends on increased physician acceptance of its hemodialysis catheter products, our ability to manage the production of higher unit volumes of catheter products and our ability to effectively distribute those products. Should our hemodialysis catheters not gain market acceptance or should we not be able to meet demand for our products, our biomedical products business could be adversely affected.

The growth of our biomedical services business depends upon our customers' ability to serve demand for the end-use items, such as orthopedic prostheses, on which our services are performed and thus is substantially beyond our control.

Our ability to expand our Biomedical business depends upon our ability to introduce new products and services. The marketing of new biomedical products requires pre-approval of government regulatory authorities, the completion of which can be lengthy and more costly than originally planned.

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

Our liquidity position may suffer significantly if Bard Access Systems is unable to achieve certain milestones during the next two years with respect to the hemodialysis patent license we previously sold to Bard.

The Company's liquidity position has benefited significantly as a result of cash receipts of \$5,000,000 in each of the years ended December 31, 2003 and 2002 arising from the sale of a hemodialysis patent license to Bard Access Systems in October 2002. Under the terms of the license sale agreement, the Company has the opportunity to receive two additional contingent payments of \$3,000,000 each upon the completion of certain milestones by Bard during the next two years. There can be no assurance that these milestones will be achieved, and such attainment is beyond the control of the Company. If Bard is unable to achieve these milestones and we do not receive the additional contingent payments, then our future cash flows and liquidity position may be adversely affected.

We have not consistently complied with Nasdaq's Marketplace rules for continued listing, which exposes us to the risk of delisting from the Nasdaq National Market.

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Our stock is currently listed on the Nasdaq National Market. In August 2002, we received notice from Nasdaq that the Company was not in compliance with Nasdaq's Marketplace Rules as a result of filing its second quarter Form 10-QSB prior to the completion of the review by the Company's independent auditors and, accordingly, was subject to possible delisting. In September 2003, the Company held an oral hearing before a Nasdaq Listing Qualifications Panel (the Panel) to request continued inclusion on Nasdaq until it became current in its periodic filings. The Panel granted the Company's request for continued listing, subject to certain conditions, including the filing of a second quarter Form 10-QSB/A and a third quarter Form 10-QSB reviewed pursuant to Statement of Auditing Standards No. 100 (SAS 100 Review) by an independent auditor. The Company subsequently filed its second quarter Form 10-QSB/A Amendment Number 2 and its third quarter Form 10-QSB which had been reviewed by its independent auditor and was able to maintain continued listing on the Nasdaq National Market. However, the Panel has informed the Company that, in order to maintain continued listing on Nasdaq, it must timely file all periodic reports with the SEC and Nasdaq for all reporting periods ending on or before December 31, 2004. If we fail to timely file any such reports, the Company will not be entitled to a new hearing on the matter and its securities will be immediately delisted from the Nasdaq National Market. If our common stock is delisted

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from the Nasdaq National Market, there could be a number of negative implications, including reduced liquidity in our common stock as a result of the loss of market efficiencies associated with the Nasdaq National 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.

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 ours. Should we be unable to offer our customers products and services that represent attractive price versus value, our business will 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 will not seek to enter our markets or that we would be able to compete effectively against such entities.

In our biomedical products business, our hemodialysis catheter products directly compete against the already established product offerings of larger competitors. Although we believe that our catheter products offer significant advantages, widespread physician acceptance of these products in preference to the more established products of competitors cannot be assured.

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

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

During the year ended December 31, 2003, sales of solar systems to the City of Chicago and ComEd and sales of biomedical services to Howmedica, Inc. each were 10% or more of consolidated net sales and revenues and, in the aggregate, amounted to approximately 26% of consolidated net sales. 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.

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.

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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 40 U.S. patents and 6 foreign patents and have a number of pending patent applications. However, despite our efforts to protect our intellectual property, we cannot assure that:

The steps we take to prevent misappropriation or infringement of our intellectual property will be successful;

Any existing or future patents will not be challenged, invalidated or circumvented;

Any pending patent applications or future applications will be approved;

Others will not independently develop similar products or processes to ours or design around our patents; or

Any of the measures described above would provide meaningful protection.

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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.

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

Substantially all 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 further to 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.

We depend on third-party contractors to manufacture substantially all of our current biomedical products.

We depend on third-party subcontractors in the U.S. for the manufacturing, assembly and packaging of our biomedical products. Any difficulty in obtaining parts or services from these subcontractors could affect our ability to meet scheduled product deliveries to customers, which could in turn have a material adverse effect on our customer relationships, business and financial results. Several significant risks are associated with reliance on third-party subcontractors, including:

The lack of assured product supply and the potential for product shortages;

Reduced control over inventory located at contractors' premises;

Limited control over delivery schedules, manufacturing yields, production costs and product quality; and

The unavailability of, or delays in obtaining, access to key process technologies.

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.

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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 30% in 2003) and we anticipate that such sales will continue to be a significant percentage of our revenue. International sales involve a variety of risks and uncertainties, including risks related to:

Reliance on strategic alliance partners such as representatives and licensees;

Compliance with changing foreign regulatory requirements and tax laws;

Reduced protection for intellectual property rights in some countries;

Longer payment cycles to collect accounts receivable in some countries;

Political instability;

Economic downturns in international markets; and

Changing restrictions imposed by United States export laws.

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

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

The use of orthopedic and other medical devices may entail a risk of physical injury to patients. To the extent we have been involved in the design and manufacturing of these products, we may be exposed to potential product liability and other damage claims. Furthermore, the use of our photovoltaic module manufacturing equipment could result in operator injury. Except for those cases brought against us in which it is alleged that we engaged in the manufacture and sale of defective heart valves with other defendants, no other claims of product liability or other damages have been initiated against us. 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.

Our Company is subject to control by principal stockholder.

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Roger G. Little, the founder, Chairman of the Board, Chief Executive Officer and President of the Company, controls approximately 35% of the Company's outstanding Common Stock. In addition, as one of two Trustees of the Company's 401(k) Plan, Mr. Little may exercise control over shares of Common Stock held by the Plan. As a result, Mr. Little is in a position to exert significant influence over actions of the Company which require stockholder approval and generally to direct the affairs of the Company, including potential acquisitions, sales and changes in control of the Company.

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

We have paid no cash dividends since the Company's inception. We anticipate retaining any future earnings for reinvestment in operations and do not anticipate that dividends will be paid in the foreseeable future. Thus, 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 the Company to fluctuate.

Our stock price has recently experienced significant volatility. While our revenues have improved since 2000, 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:

Additional 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 biomedical, alternative energy or semiconductor industries.

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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.

Item 2. Description of Property

Our corporate headquarters are located at One Patriots Park, Bedford, Massachusetts. This 74,000 square foot facility is leased and contains our administrative offices, sales and marketing offices, research and development facilities and the manufacturing facilities of the Company's biomedical and solar equipment businesses. The lease expires in November 2005. We lease an approximately 90,000 square foot facility located at 25 Sagamore Park Road, Hudson, New Hampshire that contains a semiconductor wafer growth and fabrication facility and administrative offices used primarily by our Optoelectronics business unit including Bandwidth Semiconductor. The lease expires in May 2008. In addition, the Company leases approximately 10,250 square feet of factory space located at the Chicago Center for Green Technology, 445 North Sacramento Boulevard, Chicago, Illinois, that contains administrative offices, sales and marketing offices and manufacturing facilities for its solar systems business including Spire Solar Chicago. The lease expires in February 2006. The Company believes that its facilities are suitable for their present intended purposes and adequate for the Company's current level of operations.

Item 3. Legal Proceedings

The Company has been named as a defendant in 69 cases filed from August 2001 to July 2003 in state courts in Texas by persons claiming damages from the use of allegedly defective mechanical heart valves coated by a process licensed by the Company to St. Jude Medical, Inc., the valve manufacturer, which has also been named as a defendant in the cases. In June 2003, a judge in a state court in Harris County, Texas agreed to grant the Company's motion for summary judgment based upon the principle of federal preemption with regard to 68 of those cases and to order that the cases against the Company be dismissed with prejudice. An order to this effect was signed in late July 2003. The remaining case is still pending, and due to aspects of its fact situation is not subject to the principle of federal preemption. From August 2003 to date, a total of seven new cases were filed against the Company in courts in Harris County. The plaintiffs whose cases were dismissed have filed appeals with the Texas appellate court. A decision on these appeals is pending and may be rendered early next year. Attorneys who represent the Company with respect to these cases in Texas do not believe at this time that the actions of a federal district court judge in Minnesota in denying St. Jude's request for summary judgment will materially affect the Company's position in the Texas complaints.

Item 4. Submission of Matters to a Vote of Security Holders

No matters were submitted to a vote of the Company's security holders in the fourth quarter of 2003.

Table of Contents**PART II****Item 5. Market for Common Equity and Related Stockholder Matters****Market Information**

The Company's Common Stock, \$0.01 par value (Common Stock), is traded on the Nasdaq National 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	Low
	Bid	Bid
<u>2003</u>		
First Quarter	\$ 2.86	\$ 1.78
Second Quarter	3.30	2.21
Third Quarter	5.80	2.63
Fourth Quarter	6.25	4.03
<u>2002</u>		
First Quarter	\$ 4.00	\$ 3.01
Second Quarter	4.84	2.81
Third Quarter	3.11	1.90
Fourth Quarter	2.90	1.79

These prices do not reflect retail mark-ups, mark-downs or commissions and may not reflect actual transactions. The closing price of the Common Stock on March 1, 2004 was \$4.88, and on that date, there were approximately 220 stockholders of record.

Dividends

The Company did not pay any cash dividends during 2003 or 2002 and currently does 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.

Equity Compensation Plan Information

The table below describes the securities authorized for issuance under the Company's equity incentive plans as of December 31, 2003:

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	Number of securities to be issued upon exercise of outstanding options, warrants and rights	Weighted-average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance
Equity compensation plans approved by security holders	711,328	\$ 3.44	620,977
Equity compensation plans not approved by security holders			
Total	711,328	\$ 3.44	620,977

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Item 6. 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 that involve risks and uncertainties. The Company's actual results and the timing of certain events may differ significantly from the results and timing described in the forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those described below and above in Risk Factors and Business. The following description is qualified in its entirety by, and should be read in conjunction with, the detailed information and the Consolidated Financial Statements, including the Notes thereto, appearing elsewhere or incorporated by reference in this Report. Management's Discussion and Analysis includes the following sections:

Overview;

Results of Operations;

Liquidity and Capital Resources;

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

Recent Accounting Pronouncements;

Impact of Inflation and Changing Prices;

Foreign Currency Fluctuation;

Related Party Transactions; and

Critical Accounting Policies.

Overview

The Company develops, manufactures and markets highly-engineered products and services in four principal business areas: biomedical, solar equipment, solar systems and optoelectronics bringing to bear expertise in materials technologies across all four business areas.

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; develops and markets hemodialysis catheters and related devices for the treatment of chronic kidney disease and performs sponsored research programs into practical applications of advanced biomedical and biophotonic technologies.

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In the solar equipment area, the Company develops, manufactures and markets specialized equipment for the production of terrestrial photovoltaic modules from solar cells. The Company's equipment has been installed in more than 150 factories in 42 countries.

In the solar systems area, the Company provides electric power grid-connected distributed power generation systems employing photovoltaic technology.

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

The Company's net sales and revenues for the year ended December 31, 2003 (2003) increased 7%, compared to the year ended December 31, 2002 (2002). The increase was due to the acquisition of Bandwidth Semiconductor, increased demand for the Company's medical products and additional shipments of the Company's solar energy manufacturing equipment, offset in part by reduced installations of solar systems.

Sales in the Company's solar business unit decreased 10% during 2003 as compared to 2002, as temporary permitting challenges slowed the pace of installing solar systems in the Chicago metro area. The decline in solar systems was offset in part by increased shipments of the Company's solar energy manufacturing equipment including shipment of SPI-LINE™ turnkey factories to Huangshan Ho Tin Technology Ltd. in China and to the Government of Egypt.

Revenues of the Company's subsidiary, Spire Biomedical, increased 8% during 2003, as compared to 2002 as our newly introduced line of hemodialysis catheter began to generate sales volume. Also contributing to the growth was an increased demand for the Company's ION-GUARD® implant process services and increased government-funded research and development activities.

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Sales in the Company's optoelectronics business unit increased 242% during 2003 as compared to 2002, due to the acquisition of Bandwidth Semiconductor. On May 23, 2003, the Company acquired from Stratos Lightwave, Inc. (Stratos) all of the ownership interests of Bandwidth Semiconductor, LLC (Bandwidth), a Delaware limited liability company, located in Hudson, New Hampshire for \$954,000 in cash, including acquisition related costs. Bandwidth is a compound semiconductor foundry providing material and device fabrication services to defense, telecommunications and biomedical instrument industries. The results of Bandwidth's operations have been included as a component of our optoelectronics business unit. Revenues from Bandwidth totaled \$1,746,000 for the seven months ended December 31, 2003.

Operating results will depend upon product mix, as well as the timing of shipments of higher priced products from the Company's solar equipment line and delivery of solar systems. Export sales, which amounted to 30% of net sales and revenues for 2003, continue to constitute a significant portion of the Company's net sales and revenues.

Results of Operations

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

	Year Ended December 31,		
	2003	2002	2001
Net sales and revenues	100.0%	100.0%	100.0%
Cost of sales and revenues	(80.0)	(71.7)	(74.9)
Gross profit	20.0	28.3	25.1
Selling, general and administrative expenses	(43.4)	(38.9)	(36.8)
Internal research and development	(6.9)	(2.3)	(5.0)
Gain on sale of license	31.6	30.1	
Earnings (loss) from operations	1.3	17.2	(16.7)
Interest (expense) income, net	(1.0)	0.1	1.3
Earnings (loss) before income taxes	0.3	17.3	(15.4)
Income tax expense (benefit)	0.2	2.2	(0.1)
Net earnings (loss)	0.1%	15.1%	(15.3)%

Year Ended December 31, 2003 Compared to Year Ended December 31, 2002*Net Sales and Revenues*

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Net sales and revenues increased \$981,000, or 7%, for 2003 to \$15,803,000, compared to \$14,822,000 for 2002. The increase was primarily the result of strong demand for the Company's solar equipment product lines and the contribution of Bandwidth Semiconductor, which was acquired on May 23, 2003. Contract research, services and license revenues increased \$1,576,000, or 24%, to \$8,029,000 for 2003, compared to \$6,453,000 for 2002. The increase was propelled by demand for the Company's semiconductor foundry and fab services and increased government funded research activities in both biomedical and solar energy technologies. Sales of goods decreased \$595,000, or 7%, to \$7,774,000 for 2003, compared to \$8,369,000 for 2002. The decline was due primarily to reduced solar systems installations offset in part by increased shipments of solar energy equipment and hemodialysis catheters.

The following table categorizes the Company's net sales and revenues for the periods presented:

	Year Ended December 31,		%
	2003	2002	
Contract research, services and licenses	\$ 8,029,000	\$ 6,453,000	24%
Sales of goods	7,774,000	8,369,000	(7)%
Net sales and revenues	\$ 15,803,000	\$ 14,822,000	7%

Cost of Sales and Revenues

The cost of contract research, services and licenses increased \$2,191,000 to \$5,940,000, and increased to 74% of related revenues, for 2003, compared to \$3,749,000, or 58% of related revenues, for 2002. The increase was due primarily to the increased factory overhead associated with the Company's newly acquired semiconductor foundry. The increase in factory overhead associated with the semiconductor foundry amount to \$1,405,000 in 2003. Cost of goods sold decreased

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\$186,000 to \$6,689,000, and increased to 86% of related sales for 2003, compared to \$6,875,000, or 82% of related sales, for 2002 as a result of lower sales volume and reduced absorption of fixed costs associated with the Company's Chicago facility offset in part by increased sales volume, and accompanying increased absorption of fixed costs, of the Company's hemodialysis catheter and solar energy equipment

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

	<u>December 31, 2003</u>	<u>%</u>	<u>December 31, 2002</u>	<u>%</u>
Cost of contract research, services and licenses	\$ 5,940,000	74%	\$ 3,749,000	58%
Cost of goods sold	6,689,000	86%	6,875,000	82%
Total cost of sales and revenues	\$ 12,629,000	80%	\$ 10,624,000	72%

Selling, General and Administrative Expenses

Selling, general and administrative expenses for 2003 increased \$1,098,000 to \$6,873,000, and increased to 43% of net sales and revenues, compared to \$5,775,000, or 39% of net sales and revenues, for 2002. Selling, general and administrative expenses increased as a percentage of sales primarily as a result of increased sales and marketing efforts associated with the Company's medical contracts and increased legal and auditing expenses associated with increased compliance requirements.

Internal Research and Development

Internal research and development for 2003 increased \$750,000, or 222%, to \$1,087,000, compared to \$337,000 for 2002. The increase was primarily a result of the Company's continued investment in catheter development and the next generation solar energy module manufacturing equipment under a cost-sharing contract with the Department of Energy National Renewable Energy Laboratory (NREL).

Interest

The Company earned \$56,000 in interest income for 2003 from the investment of the proceeds from the sale of the license in short-term debt securities, compared to \$77,000 for 2002. The Company incurred interest expense of \$217,000 in 2003, compared to \$59,000 in 2002. The interest expense for 2003 is primarily due to interest incurred on capital leases associated with the semiconductor foundry while interest expense during 2002 was primarily associated with borrowings on the Company's bank line of credit.

Income Taxes

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The Company recorded a tax expense of \$33,000 for 2003, compared to a tax expense of \$332,000 for 2002. The Company's effective tax rate was 79% and 13% in 2003 and 2002, respectively. The increase in the 2003 effective tax rate is substantially due to permanent differences representing 41% of earnings before income taxes versus 1% in 2002. In addition, the 2002 income tax provision benefited from a decrease in the valuation allowance that reduced the effective tax rate by 29%. At December 31, 2003, the Company had a gross deferred tax asset of \$1,050,000, against which a valuation allowance of \$509,000 had been applied. Gross deferred tax liability of \$457,000 was applied against the net deferred tax asset.

Net Income (Loss)

The Company reported net income for 2003 of \$9,000, compared to net income of \$2,237,000 for 2002. While revenue rose from 2002 to 2003, the breakeven point of the Company rose with the increased fixed costs associated with the Company's semiconductor foundry and with increased cost associated with increased compliance requirements. Net income for 2003 and 2002 included gains on the sale of a license of \$4,989,000 and \$4,465,000, respectively, arising from the sale the Company's hemodialysis patent license to Bard Access Systems. Under the terms of the license sale agreement the Company has the opportunity but not the commitment to receive two additional contingent payments of \$3,000,000 each upon the completion of certain milestones by Bard Access Systems during the next two years. There can be no assurance that these milestones will be attained and attainment is beyond the control of the Company.

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Year Ended December 31, 2002 Compared to Year Ended December 31, 2001

Net Sales and Revenues

Net sales and revenues increased \$670,000, or 5%, for 2002 to \$14,822,000, compared to \$14,152,000 for 2001. The increase was primarily the result of strong demand for the Company's ion beam-based processes. Contract research, service and license revenues increased \$1,075,000, or 20%, to \$6,453,000 for 2002, compared to \$5,378,000 for 2001. Sales of goods decreased \$405,000, or 5%, to \$8,369,000 for 2002, compared to \$8,774,000 for 2001. The decline was due primarily to excess capacity within the industry and lower than expected investment in solar module manufacturing equipment. The following table categorizes the Company's net sales and revenues for the periods presented:

	<u>Year Ended December 31,</u>		%
	<u>2002</u>	<u>2001</u>	
Contract research, service and license revenues	\$ 6,453,000	\$ 5,378,000	20%
Sales of goods	8,369,000	8,774,000	(5)%
Net sales and revenues	\$ 14,822,000	\$ 14,152,000	5%

Cost of Sales and Revenues

The cost of contract research, service and license revenues increased \$285,000 to \$3,749,000, and decreased to 58% of related revenues, for 2002, compared to \$3,464,000, or 64% of related revenues, for 2001. The decrease was due primarily to the increased volume for the medical implant services. Cost of goods sold decreased \$260,000 to \$6,875,000, and increased to 82% of related sales, for 2002, compared to \$7,135,000, or 81% of related sales, for 2001. The increase in total cost of sales was a result primarily of increased sales of the Company's ion-beam based process, which has high gross margins.

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

	<u>December 31, 2002</u>	<u>%</u>	<u>December 31, 2001</u>	<u>%</u>
Cost of contract research, service and license revenues	\$ 3,749,000	58%	\$ 3,464,000	64%
Cost of goods sold	6,875,000	82%	7,135,000	81%
Total cost of sales and revenues	\$ 10,624,000	72%	\$ 10,599,000	75%

Internal Research and Development

Internal research and development for 2002 decreased \$366,000, or 52%, to \$337,000, compared to \$703,000 for 2001. The decrease was primarily a result of the Company's reduced investment in new product development since the introduction of two hemodialysis catheter devices for the treatment of chronic kidney disease during 2002.

Selling, General and Administrative Expenses

Selling, general and administrative expenses for 2002 increased \$564,000 to \$5,775,000, and increased to 39% of sales and revenues, compared to \$5,211,000, or 37% of sales and revenues, for 2001. Selling, general and administrative expenses increased as a percentage of sales primarily as a result of increased sales and marketing efforts associated with the introduction of two new catheter devices and a one time administrative expense associated with the sale of the Company's hemodialysis patent license to Bard Access Systems.

Interest

The Company earned \$77,000 in interest income for 2002 from the investment of the proceeds from the sale of the license in short-term debt securities, compared to \$276,000 for 2001. The Company incurred interest expense of \$59,000 in 2002 and \$94,000 in 2001, of which zero was capitalized in 2002 and \$4,000 was capitalized in 2001 related to internally constructed assets.

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Income Taxes

The Company recorded a tax expense of \$332,000 for 2002, compared to a tax benefit of \$13,000 for 2001. The Company's effective tax rate was 13% in 2002 and a benefit of 1% in 2001. At December 31, 2002, the Company had a gross deferred tax asset of \$804,000, against which a valuation allowance of \$688,000 had been applied.

Net Income (Loss)

The Company reported net income for 2002 of \$2,237,000, compared to a net loss of \$2,163,000 for 2001. Net income for the year included a gain on the sale of a license of \$4,465,000 from the sale the Company's hemodialysis patent license to Bard Access Systems. The terms included an initial \$5,000,000 payment and possible additional payments of up to \$11,000,000 upon the attainment of certain milestones by Bard Access Systems.

Liquidity and Capital Resources

Our financial position remains strong, with cash and cash equivalents of \$6,662,000, including \$663,000 of restricted cash, at December 31, 2003.

During 2003, the Company has funded its operating cash requirements using operating cash flow and proceeds from the sale and licensing of technology. The Company's liquidity position benefited as a result of cash receipts of \$5,000,000 in each of the years ended December 31, 2003 and 2002 arising from the sale of a hemodialysis patent license to Bard Access Systems. The license sale agreement provides for the Company to receive two additional contingent cash payments of \$3,000,000 each upon the completion of certain milestones by Bard Access Systems during the next two years. There can be no assurance that these milestones will be attained and attainment is beyond the control of the Company.

On June 23, 2003, the Company entered into a Loan Agreement (the Agreement) with Citizens Bank of Massachusetts (the Bank). The Agreement provides Standby Letter of Credit Guarantees for foreign customers and is 100% secured with cash. At December 31, 2003, the Company had \$663,000 of restricted cash associated with letters of credit. The Agreement also provides the Company with the ability to convert to a \$2,000,000 revolving line of credit, based upon eligible accounts receivable and certain other conversion covenants. Loans under this Agreement bear interest at the Bank's prime rate as determined (4.25% at December 31, 2003.) A commitment fee of .25% is charged on any unused portion of the borrowing base. The Agreement contains covenants including certain financial reporting requirements. At December 31, 2003, the Company was not in compliance with its financial reporting requirements and cash balance covenants. The Company has received a waiver of compliance relative to these covenants from the Bank and is currently in compliance with all required covenants. The Agreement expires on June 30, 2004. Letters of Credit issued with an expiration beyond June 30, 2004 are required to be 100% secured by cash. At December 31, 2003, the Company had not exercised its conversion option and no amounts were outstanding under the revolving line of credit.

Cash and cash equivalents decreased \$1,137,000 to \$6,662,000, including restricted cash of \$663,000 at December 31, 2003 from \$7,799,000 at December 31, 2002. To date, there are no material commitments by the Company for capital expenditures. At December 31, 2003, the Company's retained earnings were \$2,470,000, compared to retained earnings of \$2,461,000 as of December 31, 2002. Working capital as of December 31, 2003 decreased 22% to \$8,182,000, compared to \$10,524,000 as of December 31, 2002.

The Company believes it has sufficient resources to finance its current operations for the foreseeable future from operating cash flow and working capital.

Contractual Obligations, Commercial Commitments and Off-Balance Sheet Arrangements

The following table summarizes the Company's gross contractual obligations at December 31, 2003 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	Payments Due by Period				
	Total	Less than 1 Year	1 - 3 Years	3 - 5 Years	More Than 5 Years
<i>Capital Leases:</i>					
Unrelated party capital lease	\$ 1,370,000	\$ 437,000	\$ 933,000	\$	\$
Related party capital lease	3,814,000	619,000	1,597,000	1,598,000	
<i>Operating Leases:</i>					
Unrelated party operating leases	222,000	120,000	96,000	6,000	
Related party operating lease	2,043,000	1,066,000	977,000		

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Capital lease obligations outlined above include both the principal and interest components of these contractual obligations. Included in the related party operating lease is the accrued lease obligation in the amount of \$965,476.

On October 8, 1999, the Company entered into an Agreement with BP Solarex (BPS) in which BPS agreed to purchase certain production equipment built by the Company, for use in the Company's Chicago factory (Spire Solar Chicago) and in return the Company agreed to purchase solar cells of a minimum of two megawatts per year over a five-year term for a fixed fee from BPS (the Purchase Commitment). BPS has the right to reclaim the equipment should the Company not meet its obligations in the Purchase Commitment. The proceeds from the sale of the production equipment purchased by BPS have been classified as an unearned purchase discount in the accompanying consolidated balance sheets. The Company will amortize this discount as a reduction to cost of sales as it purchases solar cells from BPS. During the quarter ended September 30, 2003, the Company and BPS retroactively amended the agreement to include all purchases of solar modules, solar systems, inverter systems and other system equipment purchased by the Company from BPS in the purchase commitment calculation. Amortization of the purchase discount amounted to \$39,241 for the year ended December 31, 2003.

In addition, the agreement contains a put option for BPS to have the Company create a separate legal entity for Spire Solar Chicago and for BPS to convert the value of the equipment and additional costs, as defined, into equity of the new legal entity. The percentage ownership in the joint venture would be determined based on the cumulative investments by BPS and the Company.

The amended agreement also allows the Company to terminate the agreement on 30 days notice in consideration for a termination payment based on the aggregate amount of Spire purchases of BPS products and the fair market value of the production equipment purchased by BPS at the time of the termination election. As of December 31, 2003, the Company has no intention of terminating the agreement.

In October 2002, the Company sold an exclusive patent license for a hemodialysis split-tip catheter to Bard Access Systems, Inc. (Bard), a wholly owned subsidiary of C. R. Bard, Inc., in exchange for \$5,000,000 upon the execution of the agreement, with another \$5,000,000 due upon the earlier to occur of: (a) the date of the first commercial sale of a licensed product by Bard; or (b) no more than 18 months after signing. The agreement further provides for two additional contingent cash payments of \$3,000,000 each upon the completion of certain milestones by Bard during the next two years. Bard has the right to cancel the agreement at any time subsequent to the second payment. There can be no assurances that these milestones will be attained and attainment is beyond the control of the Company. During the year ended December 31, 2002, the Company recorded the initial payment under the agreement, resulting in a gain of \$4,464,929, net of direct costs. Due to the potential length of time between the first and second payments and the cancellation provisions within the agreement, the Company did not record the potential remaining payments at that time. During June 2003, in accordance with the agreement, the Company received notification from Bard of the first commercial sale, collected the \$5,000,000 payment due and recorded a gain of \$4,989,150, net of direct costs. These gains have been recorded in the accompanying consolidated statements of operations for the years ended December 31, 2003 and 2002, respectively. The Company believes that the sale of the license does not reflect the day-to-day operations of the Company. Therefore, the net proceeds received has been classified under investing activities in the consolidated statements of cash flows for the years ended December 31, 2003 and December 31, 2002, respectively.

Outstanding letters of credit totaled \$663,000 at December 31, 2003. The letters of credit principally secure performance obligations, and allow holders to draw funds up to the face amount of the letter of credit if the Company does not perform as contractually required. These letters of credit expire through 2005 and are 100% secured by cash.

Recent Accounting Pronouncements

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In May 2003, the Financial Accounting Standards Board (FASB) issued Statement of Financial Accounting Standards No. 150, Accounting for Certain Financial Instruments with Characteristics of Both Liabilities and Equity , (SFAS 150). SFAS 150 requires issuers to classify as liabilities (or assets in some circumstances) three classes of freestanding financial instruments that embody obligations for the issuer. Generally, SFAS 150 is effective for financial instruments entered into or modified after May 31, 2003 and is otherwise effective at the beginning of the first interim period beginning after June 15, 2003. The adoption of this statement did not have a material effect on the Company's financial position or results of operations.

In January 2003, the FASB issued FASB Interpretation No. 46, Consolidation of Variable Interest Entities (FIN 46) which requires the consolidation of variable interest entities by the primary beneficiary of the entity if the equity investors in the entity do not have the characteristics of a controlling financial interest or do not have sufficient equity at risk for the entity to finance its activities without additional subordinated financial support from other parties. In

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December 2003, the FASB issued FASB Interpretation No. 46R, Consolidation of Variable Interest Entities (FIN 46R). FIN 46R superseded FIN 46 and defers the effective date for small business filers until the first reporting period that ends after December 15, 2004 (fourth quarter of 2004). The adoption of FIN 46R is not anticipated to have a material impact on the Company's financial position or results of operation.

In December 2002, the FASB issued SFAS No. 148, Accounting for Stock Based Compensation Transition and Disclosure an Amendment of SFAS 123 (SFAS 148). SFAS 148 provides additional transition guidance for those entities that elect to voluntarily adopt the provisions of SFAS 123, Accounting for Stock Based Compensation. Furthermore, SFAS 148 mandates new disclosures in both interim and year-end financial statements of the method of accounting for stock-based employee compensation and the effect of the method used on reported results. The adoption of SFAS 148 did not have a material impact on the Company's financial position or results of operation.

In November 2002, the FASB issued FASB Interpretation No. 45, Guarantor's Accounting and Disclosure Requirements for Guarantees, Including Indirect Guarantees of Indebtedness of Others (FIN 45). FIN 45 requires that upon issuance of a guarantee, a guarantor must recognize a liability for the fair value of an obligation assumed under a guarantee. FIN 45 also requires additional disclosures by a guarantor in its interim and annual financial statements about the obligations associated with guarantees issued including product warranties. The recognition provisions of FIN 45 is effective for any guarantees that are issued or modified after December 31, 2002. The adoption of FIN 45 did not have a material impact on the Company's financial position or results of operations.

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

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

Spire Solar Systems warrants photovoltaic electric power systems sold against defective components for 360 days to include the replacement of defective component parts and the labor to correct the defect. Spire Solar Systems also warrants that its photovoltaic electric power systems will achieve a minimum of 80% of rated electrical power output for 20 years.

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.

Bandwidth 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.

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In June 2001, the Financial Accounting Standards Board issued Statement of Financial Accounting Standards No. 141, Business Combinations (SFAS No. 141) and SFAS No. 142, Goodwill and Other Intangible Assets (SFAS No. 142). SFAS No. 141 requires that the purchase method of accounting be used for all business combinations. SFAS No. 141 specifies criteria that intangible assets acquired in a business combination must meet to be recognized and reported separately from goodwill. SFAS No. 142 required that goodwill and intangible assets with indefinite useful lives no longer be amortized, but instead tested for impairment at least annually in accordance with the provisions of SFAS No. 142.

The Company adopted the provisions of SFAS No. 141 as of July 1, 2001, and SFAS No. 142 as of January 1, 2002. Goodwill and intangible assets determined to have an indefinite useful life acquired in a purchase business combination completed after June 30, 2001, but before SFAS No. 142 was adopted in full, are not amortized. The adoption of the SFAS No. 141 and 142 has not had a material impact on the Company's financial position or results of operations.

Impact of Inflation and Changing Prices

Historically, the Company's 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. The Company has not experienced any negative effects from the impact of inflation on long-term contracts. The Company's 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.

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Foreign Exchange Fluctuation

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

Related Party Transactions

The Company subleases 74,000 square-feet in a building leased by Mykrolis Corporation, who in turn leases the building from a Trust of which Roger G. Little, Chairman of the Board, Chief Executive Officer and President of the Company, is sole trustee and principal beneficiary. The Company believes that the terms of the third-party sublease are commercially reasonable. The 1985 sublease originally was for a period of ten years, was extended for a five-year period expiring on November 30, 2000 and was further extended for a five-year period expiring on November 30, 2005. The agreement provides for minimum rental payments plus annual increases linked to the consumer price index. Rent expense under this sublease for the year ended December 31, 2003 was \$855,000, net of \$211,000 of sublet income received from Bandwidth prior to its acquisition (the Company sublet a portion of the building to Bandwidth prior to its acquisition by the Company).

In conjunction with the acquisition of Bandwidth by the Company, the Company released Bandwidth from the lease agreement that had existed between Bandwidth and the Company. In November 2001, Bandwidth, under its previous owner, abandoned the space being subleased from the Company in Bedford, Massachusetts, to move to a new building and wafer fabrication lab in Hudson, New Hampshire. At that time, there were 48 months left on the lease. Subsequent to the move to Hudson, New Hampshire, Bandwidth was unable to sublease the Bedford, Massachusetts space, and was paying the Company for the unused space. In conjunction with the acquisition of Bandwidth in May 2003, the Company released Bandwidth from the remaining lease payments. However, the Company continues to be obligated to Mykrolis Corporation for the entire amount of the remaining lease agreement. As a result, the present value of the remaining lease obligation associated with the unused space was recorded as an assumed liability of \$1,247,241 in the purchase accounting. As of December 31, 2003, the remaining lease obligation is \$965,476, which is reflected as accrued lease obligation related party in the December 31, 2003 consolidated balance sheet. The amount due beyond one year has been reflected in long-term liabilities. The difference between the actual rent payment and the discounted rent payment will be accreted to the consolidated statements of operations as interest expense. Interest expense recorded related to this obligation was \$26,000 in 2003. Interest of 6.28% has been assumed on this obligation.

Also in conjunction with the acquisition of Bandwidth by the Company, SPI-Trust, a Trust of which Roger G. Little, Chairman of the Board, Chief Executive Officer and President of the Company, is sole trustee and principal beneficiary, purchased from Stratos the building that Bandwidth occupies in Hudson, New Hampshire for \$3.7 million. Subsequently, the Company entered into a lease for the building (90,000 square feet) with SPI-Trust whereby the Company will pay \$4.1 million to the SPI-Trust over an initial five year term expiring in 2008 with a Company option to extend for five years. The lease agreement does not provide for a transfer of ownership at any point. This lease has been classified as a related party capital lease and a summary of payments (including interest) follows:

<u>Year</u>	<u>Rate Per Square Foot</u>	<u>Annual Rent</u>	<u>Monthly Rent</u>
Year 1	\$ 6.00	\$ 540,000	\$ 45,000
Year 2	7.50	675,000	56,250
Year 3	8.50	765,000	63,750
Year 4	10.50	945,000	78,750

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Year 5	13.50	<u>1,215,000</u>	101,250
		<u>\$ 4,140,000</u>	

At December 31, 2003, \$406,289 and \$2,796,347 are reflected as the current and long-term portions of capital lease obligation related party, respectively, in the December 31, 2003 consolidated balance sheet. Interest costs were assumed at 7%. Interest expense of \$138,000 related to this obligation was recorded in the 2003 consolidated statement of operations.

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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 long-lived assets, income taxes, and warranties. We regularly evaluate our estimates and assumptions based upon historical experience and various other factors that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. To the extent actual results differ from those estimates, our future results of operations may be affected. We believe the following critical accounting policies affect our more significant judgments and estimates used in the preparation of our consolidated financial statements. Refer to Footnote 2 of our notes to consolidated financial statements for a description of our accounting policies for income taxes and warranties.

Revenue Recognition

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

We generally recognize product revenue upon shipment of products provided there are no uncertainties regarding customer acceptance, persuasive evidence of an arrangement exists, the sales price is fixed or determinable, and collectibility is deemed probable. Gross sales reflect reductions attributable to various customer incentive programs including pricing discounts and rebates. Certain customer incentive programs require management to estimate the cost of those programs. The accrued liability for these programs is determined through analysis of programs offered, historical trends, expectations regarding customer and consumer participation, sales and payment trends, and experience with payment patterns associated with similar programs that had been previously offered. The Company's OEM capital equipment solar energy business builds complex customized machines to order for specific customers. Substantially all of these orders are sold on a FOB Bedford, Massachusetts (or EXW Factory) basis. It is the Company's policy to recognize revenues for this equipment as the product is shipped to the customer, as customer acceptance is obtained prior to shipment and the equipment is expected to operate the same in the customer's environment as it does in the Company's environment. When an arrangement with the customer includes future obligations or customer acceptance, revenue is recognized when those obligations are met or customer acceptance has been achieved. The Company's solar energy systems business installs solar energy systems on customer-owned properties on a contractual basis. Generally, revenue is recognized once the systems have been installed and the title is passed to the customer. For arrangements with a number of elements, the Company allocates fair value to each element in the contract and revenue is recognized upon delivery of the element.

The Company's biomedical subsidiary and semiconductor foundry and fab perform specialty material processing services for various manufacturers on a contractual basis. The Company recognizes revenue as the processed products are shipped to the customer.

The Company recognizes revenues and estimated profits on long-term government contracts on a percentage-of-completion method of accounting using a cost-to-cost methodology. 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. 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 an audit performed by the United States government.

Impairment of Long-lived Assets

Long-lived assets, including fixed assets and intangible assets, are continually monitored and are evaluated at least annually for impairment. The determination of recoverability is based on an estimate of undiscounted cash flows expected to result from the use of an asset and its eventual disposition. The estimate of cash flows is based upon, among other things, certain assumptions about expected future operating performance. Our estimates of undiscounted cash flows may differ from actual cash flows due to, among other things, technological changes, economic conditions, changes to our business model or changes in our operating performance. If the sum of the undiscounted cash flows (excluding interest) is less than the carrying value, we recognize an impairment loss, measured as the amount by which the carrying value exceeds the fair value of the asset.

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Acquisition Accounting

Through its acquisition, the Company has accumulated assets the valuation of which involves estimates based on fair value assumptions. Estimated lives assigned to the assets acquired in a business purchase also involve the use of estimates. These matters that are subject to judgments and estimates are inherently uncertain, and different amounts could be reported using different methodologies. Management uses its best estimate in determining the appropriate values and estimated lives to reflect in the consolidated financial statements, using historical experience, market data, and all other available information.

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Item 7. Financial Statements

Consolidated Financial Statements

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INDEPENDENT AUDITOR'S REPORT

To the Board of Directors and Stockholders
of Spire Corporation:

We have audited the consolidated balance sheet of Spire Corporation and subsidiaries as of December 31, 2003 and the related consolidated statements of operations, stockholders' equity, and cash flows for the year ended December 31, 2003. These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audit.

We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe our audit provides 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, 2003, and the results of their operations and their cash flows for the year ended December 31, 2003 in conformity with accounting principles generally accepted in the United States of America.

/s/ Vitale, Caturano & Company, P.C.

Boston, Massachusetts

March 18, 2004

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INDEPENDENT AUDITOR S REPORT

To the Board of Directors and Stockholders
of Spire Corporation:

We have audited the consolidated balance sheet of Spire Corporation and subsidiaries as of December 31, 2002, and the related consolidated statements of operations, stockholders' equity, and cash flows for each of the years in the two-year period ended December 31, 2002. These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits.

We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe 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, 2002, and the results of their operations and their cash flows for each of the years in the two-year period ended December 31, 2002 in conformity with accounting principles generally accepted in the United States of America.

/s/ KPMG LLP

Boston, Massachusetts

March 20, 2003

Table of Contents**SPIRE CORPORATION AND SUBSIDIARIES****CONSOLIDATED BALANCE SHEETS**

	December 31,	
	2003	2002
ASSETS		
Current assets		
Cash and cash equivalents	\$ 5,999,091	\$ 7,798,716
Restricted cash	662,889	
	<u>6,661,980</u>	<u>7,798,716</u>
Accounts receivable, trade:		
Amounts billed	4,037,153	3,574,851
Retainage	44,669	67,715
Unbilled costs	440,335	634,958
	<u>4,522,157</u>	<u>4,277,524</u>
Less: allowance for doubtful accounts	(281,820)	(349,443)
Net accounts receivable, trade	<u>4,240,337</u>	<u>3,928,081</u>
Inventories	1,430,989	2,220,587
Refundable income taxes	523,000	
Deferred income taxes	231,864	116,000
Due from related party	101,992	84,785
Prepaid expenses and other current assets	292,341	903,715
	<u>13,482,503</u>	<u>15,051,884</u>
Total current assets		
Property and equipment	23,608,764	15,604,809
Less accumulated depreciation and amortization	(14,742,523)	(13,132,220)
Net property and equipment	<u>8,866,241</u>	<u>2,472,589</u>
Patents (less accumulated amortization, \$519,521 in 2003 and \$499,505 in 2002)	434,899	241,313
Other assets	8,325	6,324
	<u>443,224</u>	<u>247,637</u>
Total other assets		
Total assets	<u>\$ 22,791,968</u>	<u>\$ 17,772,110</u>
LIABILITIES AND STOCKHOLDERS EQUITY		
Current liabilities		
Current portion of capital lease obligation	\$ 374,602	\$
Current portion of capital lease obligation related party	406,289	
Accounts payable	1,382,424	1,852,332
Accrued liabilities	1,464,561	1,392,585

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Income taxes payable		224,000
Current portion of accrued lease obligation related party	492,777	
Advances on contracts in progress	1,179,793	1,058,852
	<u>5,300,446</u>	<u>4,527,769</u>
Total current liabilities		
Long-term portion of capital lease obligation	848,365	
Long-term portion of capital lease obligation related party	2,796,347	
Accrued lease obligation related party	472,699	
Deferred income taxes	147,864	
Unearned purchase discount	1,429,882	1,469,123
	<u>5,695,157</u>	<u>1,469,123</u>
Total long-term liabilities		
Total liabilities	<u>10,995,603</u>	<u>5,996,892</u>
<u>Commitments and Contingencies:</u>		
<u>Stockholders' equity</u>		
Common stock, \$0.01 par value; shares authorized 20,000,000; issued 6,765,660 shares in 2003 and 6,759,660 shares in 2002	67,657	67,597
Additional paid-in capital	9,258,536	9,246,381
Retained earnings	2,470,172	2,461,240
	<u>11,796,365</u>	<u>11,775,218</u>
Total stockholders' equity		
Total liabilities and stockholders' equity	<u>\$ 22,791,968</u>	<u>\$ 17,772,110</u>

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

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SPIRE CORPORATION AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS

	Years Ended December 31,		
	2003	2002	2001
Net sales and revenues			
Contract research, service and license revenues	\$ 8,028,504	\$ 6,453,233	\$ 5,377,504
Sales of goods	7,774,364	8,368,976	8,774,284
Total net sales and revenues	15,802,868	14,822,209	14,151,788
Costs and expenses			
Cost of contract research, services and licenses	5,940,488	3,749,139	3,464,343
Cost of goods sold	6,688,932	6,875,335	7,135,377
Selling, general and administrative expenses	6,873,121	5,775,412	5,211,360
Internal research and development	1,086,588	337,034	703,132
Total costs and expenses	20,589,129	16,736,920	16,514,212
Gain on sale of a license	4,989,150	4,464,929	
Earnings (loss) from operations	202,889	2,550,218	(2,362,424)
Interest (expense) income, net	(160,525)	18,433	186,434
Earnings (loss) before income taxes	42,364	2,568,651	(2,175,990)
Income tax expense (benefit)	33,432	332,000	(12,998)
Net income (loss)	\$ 8,932	\$ 2,236,651	\$ (2,162,992)
Earnings (loss) per share of common stock — basic	\$ 0.00	\$ 0.33	\$ (0.32)
Earnings (loss) per share of common stock — diluted	\$ 0.00	\$ 0.33	\$ (0.32)
Weighted average number of common and common equivalent shares outstanding — basic	6,764,394	6,749,783	6,694,933
Weighted average number of common and common equivalent shares outstanding — diluted	6,869,668	6,842,071	6,694,933

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

Years Ended December 31, 2003, 2002 and 2001

	Common Stock		Additional Paid-in Capital	Treasury Stock		Retained Earnings	Total
	Shares	Amount		Shares	Amount		
Balance, December 31, 2000	6,685,824	\$ 66,858	\$ 8,876,979		\$	\$ 2,387,581	\$ 11,331,418
Exercise of stock options	50,836	509	99,464				99,973
Net loss						(2,162,992)	(2,162,992)
Balance, December 31, 2001	6,736,660	67,367	8,976,443			224,589	9,268,399
Exercise of stock options	23,000	230	45,938				46,168
Tax benefit from stock option exercises			224,000				224,000
Net income						2,236,651	2,236,651
Balance, December 31, 2002	6,759,660	67,597	9,246,381			2,461,240	11,775,218
Exercise of stock options	1,000	10	1,305				1,315
Stock grant	5,000	50	10,850				10,900
Net income						8,932	8,932
Balance, December 31, 2003	6,765,660	\$ 67,657	\$ 9,258,536		\$	\$ 2,470,172	\$ 11,796,365

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

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SPIRE CORPORATION AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Years Ended December 31,		
	2003	2002	2001
<u>Cash flows from operating activities:</u>			
Net income (loss)	\$ 8,932	\$ 2,236,651	\$ (2,162,992)
Adjustments to reconcile net income (loss) to net cash used in operating activities:			
Depreciation and amortization	1,630,319	787,846	583,287
Deferred income taxes	32,000	(116,000)	
Gain on sale of a license	(4,989,150)	(4,464,929)	
Stock grant	10,900		
Tax benefit on stock option exercises		224,000	
Loss (gain) on sale and abandonment of assets			23,842
Changes in assets and liabilities (excluding business acquisition):			
Restricted cash	(662,889)		
Accounts receivable, net	(31,817)	(240,899)	(561,024)
Inventories	835,815	(908,578)	1,734,389
Prepaid expenses and other current assets	554,443	(65,130)	(6,420)
Refundable income taxes	(523,000)		260,000
Accounts payable, income taxes payable and accrued liabilities	(1,154,525)	742,286	266,592
Unearned purchase discounts	(39,241)	(8,979)	947,875
Advances on contracts in progress	120,941	592,339	(1,104,171)
	(4,207,272)	(1,221,393)	(18,622)
<u>Cash flows from investing activities:</u>			
Net proceeds from sale of a license	4,989,150	4,534,262	
Additions to property and equipment	(1,017,759)	(170,963)	(1,577,420)
Acquisition, net of cash acquired	(954,351)		
Increase in patent costs	(213,602)	(99,425)	(116,265)
Other assets	(2,001)	2,183	(40,225)
	2,801,437	4,266,057	(1,733,910)
<u>Cash flows from financing activities:</u>			
Net borrowings (payments) on short-term debt		(875,000)	325,000
Principal payment on capital lease obligations related parties.	(187,761)		
Principal payment on capital lease obligations	(207,344)		
Exercise of stock options	1,315	46,168	99,973
	(393,790)	(828,832)	424,973
Net cash provided by (used in) financing activities	(393,790)	(828,832)	424,973
Net increase (decrease) in cash and cash equivalents	(1,799,625)	2,215,832	(1,327,559)
Cash and cash equivalents, beginning of year	7,798,716	5,582,884	6,910,443
Cash and cash equivalents, end of year	\$ 5,999,091	\$ 7,798,716	\$ 5,582,884

Supplemental disclosures of cash flow and non-cash flow information

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Acquisition of Bandwidth Semiconductor:			
Assets acquired	\$ 3,998,595	\$	\$
Liabilities assumed (including related party obligation of \$1,247,241)	\$ (3,044,244)	\$	\$
	<u> </u>	<u> </u>	<u> </u>
Cash paid, including acquisition costs	\$ 954,351	\$	\$
	<u> </u>	<u> </u>	<u> </u>
Non-cash financing activities:			
Capital lease obligation related party	\$ 3,390,397	\$	\$
	<u> </u>	<u> </u>	<u> </u>
Cash paid during the period for:			
Interest	\$ 63,545	\$ 58,686	\$ 93,686
	<u> </u>	<u> </u>	<u> </u>
Interest related party	\$ 138,238	\$	\$
	<u> </u>	<u> </u>	<u> </u>
Income taxes	\$ 695,000	\$	\$
	<u> </u>	<u> </u>	<u> </u>

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

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SPIRE CORPORATION AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

December 31, 2003, 2002 and 2001

1. Description of the Business

The Company develops, manufactures and markets highly-engineered products and services in four principal business areas: Biomedical, Solar Equipment, Solar Systems and optoelectronics, generally bringing to bear expertise in materials technologies, surface science and thin films across all four business areas.

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; develops and markets hemodialysis catheters and related devices for the treatment of chronic kidney disease; and performs sponsored research programs into practical applications of advanced biomedical and biophotonic technologies.

The Company develops, custom manufactures and markets specialized equipment for the production of terrestrial photovoltaic modules from solar cells. The Company's equipment has been installed in more than 150 factories in 42 countries. The Company also manufactures and markets solar photovoltaic systems suitable both for stand alone emergency power backup and for interconnection into the electric power grid.

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

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 three primary sources: (1) commercial products including, but not limited to, solar energy manufacturing equipment, solar energy systems and hemodialysis catheters; (2) biomedical and semiconductor processing services; and (3) United States government funded research and development contracts.

The Company generally recognizes product revenue upon shipment of products provided there are no uncertainties regarding customer acceptance, persuasive evidence of an arrangement exists, the sales price is fixed or determinable, and collectibility is deemed probable. Gross sales reflect reductions attributable to various customer incentive programs including pricing discounts and rebates. Certain customer incentive programs require management to estimate the cost of those programs. The accrued liability for these programs is determined through analysis of programs offered, historical trends, expectations regarding customer and consumer participation, sales and payment trends, and experience with payment patterns associated with similar programs that had been previously offered. The Company's OEM capital equipment solar energy business builds complex customized machines to order for specific customers. Substantially all of these orders are sold on a FOB Bedford, Massachusetts (or EXW Factory) basis. It is the Company's policy to recognize revenues for this equipment as the product is shipped to the customer, as customer acceptance is obtained prior to shipment and the equipment is expected to operate the same in the customer's environment as it does in the Company's environment. When an arrangement with the customer includes future obligations or customer acceptance, revenue is recognized when those obligations are met or customer acceptance has been achieved. The Company's solar energy systems business installs solar energy systems on customer-owned properties on a contractual basis. Generally, revenue is recognized once the systems have been installed and the title is passed to the customer. For arrangements with a number of elements, the Company allocates fair value to each element based on rates quoted in the contract and revenue is recognized upon delivery of the element. The Company's biomedical subsidiary and semiconductor foundry and fab perform specialty material processing services for various manufacturers on a contractual basis. The Company recognizes revenue as the processed products are shipped to the customer. The Company recognizes revenues and estimated profits on long-term government contracts on a

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SPIRE CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)

December 31, 2003, 2002 and 2001

percentage of completion method of accounting using a cost-to-cost methodology. Profit estimates are revised periodically based upon changes in facts and estimates, 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 an audit performed by the United States government.

(c) Inventories

Inventories are stated at the lower of cost or market, cost being determined on a first-in, first-out (FIFO) basis.

(d) Property and Equipment

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

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

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

(e) Intangible Assets

In July 2002, the Financial Accounting Standards Board (FASB) issued Statement of Financial Accounting Standards (SFAS) No. 142, Goodwill and Other Intangible Assets . The Company adopted SFAS 142 as of January 1, 2002. SFAS 142 requires goodwill and intangible assets with indefinite lives to no longer be amortized, but instead be tested for impairment at least annually. With the adoption of SFAS 142, the Company reassessed the useful lives and residual values of all acquired intangible assets to make any necessary amortization period adjustments. Based on that assessment, no adjustments were made to the amortization period or residual values of other intangible assets. At December 31,

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2003 and 2002, the Company had no Goodwill or Intangible Assets with indefinite lives.

Patents amounted to \$434,899 (net of accumulated amortization of \$519,521) and \$241,313 (net of accumulated amortization of \$499,505) at December 31, 2003 and December 31, 2002, 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 for, and the Company believes will be approved by the government. These costs are capitalized and amortized over their useful lives or terms, ordinarily five years, using the straight-line method. There are no expected residual values related to these patents. For disclosure purposes, the table below includes future amortization expense for patents owned by the Company as well as \$62,000 of estimated amortization expense related to patents that remain pending. Estimated amortization expense for the periods ending December 31, is as follows:

Year	Amortization Expense
2004	\$ 79,022
2005	78,341
2006	72,543
2007	72,543
2008	71,980
Thereafter	60,470
	\$ 434,899

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SPIRE CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)

December 31, 2003, 2002 and 2001

(f) Income Taxes

In accordance with SFAS No. 109, Accounting for Income Taxes (SFAS 109), the Company recognizes deferred income taxes based on the expected future tax consequences of differences between the financial statement basis and the tax basis of assets and liabilities, calculated using enacted tax rates in effect for the year in which the differences are expected to be reflected in the tax return.

(g) Research and Development Costs

Research and development costs are charged to operations as incurred, except where such costs are reimbursable under customer funded contracts. During the years ended December 31, 2003, 2002 and 2001, unfunded research and development costs were \$1,087,000, \$337,000 and \$703,000, respectively.

(h) Earnings (Loss) Per Share

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

(i) 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. Significant estimates include the use of percentage-of-completion revenue recognition, valuation of income tax assets and intangible assets. Actual results could differ from those estimates.

(j) Financial Instruments

Financial instruments of the Company consist of cash and cash equivalents, accounts receivable, accounts payable and capital leases. The carrying amounts of these financial instruments approximate their fair value.

(k) Long-lived Assets

The Company accounts for long-lived assets in accordance with the provisions of SFAS No. 144, Accounting for the Impairment or Disposal of Long-Lived Assets. SFAS No. 144 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 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.

(l) Stock-Based Compensation

The Company has adopted the disclosure provisions of SFAS No. 148, Accounting for Stock-Based Compensation-Transition and Disclosure which is an amendment of SFAS No. 123 Accounting for Stock-Based Compensation, and continues to apply Accounting Principles Board Opinion No. 25 and related interpretations in accounting for its stock plans. If the Company had elected to recognize compensation cost for all of the plans based upon the fair value at the grant dates for awards under those plans, consistent with the method prescribed by SFAS 123, net income (loss) and earnings (loss) per share would have been changed to the pro forma amounts indicated below.

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SPIRE CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)

December 31, 2003, 2002 and 2001

	For the Year Ended December 31,		
	2003	2002	2001
Net earnings (loss), as reported	\$ 8,932	\$ 2,236,651	\$ (2,162,992)
Deduct: Total stock-based employee compensation expense determined under fair value based method for all awards, net of related tax effects	(339,606)	(326,200)	(111,671)
Pro forma net earnings (loss)	\$ (330,674)	\$ 1,910,451	\$ (2,274,663)
Earnings (loss) per share:			
Basic as reported	\$ 0.00	\$ 0.33	\$ (0.32)
Basic pro forma	\$ (0.05)	\$ 0.28	\$ (0.34)
Diluted as reported	\$ 0.00	\$ 0.33	\$ (0.32)
Diluted pro forma	\$ (0.05)	\$ 0.28	\$ (0.34)

The per-share weighted-average fair value of stock options granted in 2003, 2002 and 2001 was \$2.45, \$2.19 and \$3.25, 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
2003		3.27%	5 years	92.0%
2002		3.94%	5 years	98.1%
2001		4.42%	5 years	96.9%

(m) Cash and Cash Equivalents

Cash and cash equivalents include cash, time deposits and all highly liquid debt instruments with an original maturity of three months or less. These investments are carried at cost, which approximates market value.

(n) Shipping and Handling Costs

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

(o) Reclassifications

Certain prior year amounts have been reclassified to conform with current presentation.

(p) New Accounting Standards

In May 2003, FASB issued SFAS No. 150, Accounting for Certain Financial Instruments with Characteristics of Both Liabilities and Equity . SFAS 150 requires issuers to classify as liabilities (or assets in some circumstances) three classes of freestanding financial instruments that embody obligations for the issuer. Generally, SFAS 150 is effective for financial instruments entered into or modified after May 31, 2003 and is otherwise effective at the beginning of the first interim period beginning after June 15, 2003. The adoption of this statement did not have a material effect on the Company s results of operations or financial position.

In January 2003, the FASB issued FASB Interpretation No. 46, Consolidation of Variable Interest Entities (FIN 46) which requires the consolidation of variable interest entities by the primary beneficiary of the entity if the equity investors in the entity do not have the characteristics of a controlling financial interest or do not have sufficient equity at risk for the entity to finance its activities without additional subordinated financial support from other parties. In

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SPIRE CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)

December 31, 2003, 2002 and 2001

December 2003, the FASB issued FASB Interpretation No. 46R, Consolidation of Variable Interest Entities (FIN46R). FIN 46R superceded FIN46 and defers the effective date for small business filers until the first reporting period that ends after December 15, 2004 (fourth quarter of 2004). The adoption of FIN No. 46R is not anticipated to have a material impact on the Company's financial position or results of operations.

In December 2002, the FASB issued SFAS No. 148, Accounting for Stock Based Compensation Transition and Disclosure an Amendment of SFAS 123. SFAS 148 provides additional transition guidance for those entities that elect to voluntarily adopt the provisions of SFAS 123, Accounting for Stock Based Compensation. Furthermore, SFAS 148 mandates new disclosures in both interim and year-end financial statements of the method of accounting for stock-based employee compensation and the effect of the method used on reported results. The adoption of SFAS 148 did not have a material impact on the Company's financial position or results of operations.

In November 2002, the FASB issued FASB Interpretation No. 45, Guarantor's Accounting and Disclosure Requirements for Guarantees, Including Indirect Guarantees of Indebtedness of Others (FIN 45). FIN 45 requires that upon issuance of a guarantee, a guarantor must recognize a liability for the fair value of an obligation assumed under a guarantee. FIN 45 also requires additional disclosures by a guarantor in its interim and annual financial statements about the obligations associated with guarantees issued including product warranties. The recognition provisions of FIN 45 are effective for any guarantees that are issued or modified after December 31, 2002. The adoption of FIN 45 did not have a material impact on the Company's financial position or results of operations.

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

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

Spire Solar Systems warrants photovoltaic electric power systems sold against defective components for 360 days to include the replacement of defective component parts and the labor to correct the defect. Spire Solar Systems also warrants that its photovoltaic electric power systems will achieve a minimum of 80% of rated electrical power output for 20 years.

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.

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Bandwidth 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. The changes in the product warranties for the year ended December 31, 2003, are as follows:

Balance at December 31, 2002	\$ 50,000
Provision charged to income	22,107
Usage	(22,107)
	<hr/>
Balance at December 31, 2003	\$ 50,000
	<hr/>

In June 2001, the FASB issued SFAS No. 141, Business Combinations and SFAS No. 142, Goodwill and Other Intangible Assets. SFAS No. 141 requires that the purchase method of accounting be used for all business combinations. SFAS No. 141 specifies criteria that intangible assets acquired in a business combination must meet to be recognized and reported separately from goodwill. SFAS No. 142 required that goodwill and intangible assets with indefinite useful lives no longer be amortized, but instead tested for impairment at least annually in accordance with the provisions of SFAS No. 142.

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SPIRE CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)

December 31, 2003, 2002 and 2001

The Company adopted the provisions of SFAS No. 141 as of July 1, 2001 and SFAS No. 142 as of January 1, 2002. The Company had no goodwill and intangible assets determined to have an indefinite useful life acquired in a purchase business combination completed after June 30, 2001, but before SFAS No. 142. The adoption of SFAS Nos. 141 and 142 did not have a material impact on the Company's financial position or results of operations.

3. Accounts Receivable / Advances on Contracts in Progress

Unbilled costs on contracts in progress represent revenues recognized on contracts for which billings have not been presented to customers as of each balance sheet date. These amounts are billed and generally collected within one year.

Retainage represents revenues on certain United States government sponsored research and development contracts. These amounts, which usually represent 15% of the Company's research fee on each applicable contract, are not collectible until a final cost review has been performed by government auditors. Included in retainage are amounts expected to be collected after one year, which totaled \$45,000 and \$68,000 at December 31, 2003 and 2002, respectively. All other accounts receivable are expected to be collected within one year.

All contracts with United States government agencies have been audited by the government through December 2000. The Company has not incurred significant losses as a result of government audits.

The Company maintains allowances for doubtful accounts for estimated losses resulting from the inability of its customers to pay amounts due. Bad debts are written off against the allowance when identified.

4. Inventories

Inventories consist of the following:

December 31,	
2003	2002

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Raw materials	\$ 653,236	\$ 662,384
Work in process	544,490	1,324,345
Finished goods	233,263	233,858
	<u>\$ 1,430,989</u>	<u>\$ 2,220,587</u>

5. Other Current Assets

At December 31, 2002, other current assets included an escrow account in the amount of \$590,225 used as a pledge established to secure payment of the Company's obligations to Stratos Lightwave, Inc. (Stratos), the purchaser of the Company's optoelectronics business. In February 2003, the Company, Methode Electronics, Inc. and Stratos concluded a settlement of all outstanding claims between them, which involved the payment of most of the disputed escrow funds to the Company.

6. Property and Equipment

Property and equipment consists of the following:

	December 31,	
	2003	2002
Building under capital lease	\$ 3,390,397	\$
Equipment under capital lease	880,927	
Machinery and equipment	13,903,189	10,859,235
Furniture fixtures and computer equipment	3,484,733	2,956,690
Leasehold improvements	1,780,817	1,664,911
Construction in progress	168,701	123,973
	<u>\$ 23,608,764</u>	<u>\$ 15,604,809</u>

Table of Contents**SPIRE CORPORATION AND SUBSIDIARIES****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)****December 31, 2003, 2002 and 2001****7. Accrued Liabilities**

Accrued liabilities include the following:

	December 31,	
	2003	2002
Accrued payroll and payroll taxes	\$ 484,263	\$ 435,119
Accrued legal and audit fees	211,400	401,142
Accrued other	768,898	556,324
	\$ 1,464,561	\$ 1,392,585

8. Notes Payable and Credit Arrangements

Prior to June 23, 2003, the Company had a \$2,000,000 revolving credit agreement with Silicon Valley Bank (the "SVB Agreement"). Interest on the SVB Agreement was at the Bank's prime rate plus 1/2 percent. (4.25% at December 31, 2002). The SVB Agreement contained covenants including provisions relating to profitability and net worth. There were no amounts outstanding under the SVB Agreement at December 31, 2002. On June 23, 2003, the Company entered into a new Loan Agreement (the "Agreement") with Citizens Bank of Massachusetts. The Agreement provides Standby Letter of Credit Guarantees for foreign customers and is 100% secured with cash. At December 31, 2003, the Company had \$663,000 of restricted cash associated with letters of credit. The Agreement also provides the Company with the ability to convert to a \$2,000,000 revolving line of credit, based upon eligible accounts receivable and certain conversion covenants. Loans under this Agreement bear interest at the Bank's prime rate as determined (4.25% at December 31, 2003.) A commitment fee of .25% is charged on the unused portion of the borrowing base. The Agreement contains covenants including certain financial reporting requirements. At December 31, 2003, the Company was not in compliance with its financial reporting requirements and cash balance covenants. The Company has received a waiver of compliance relative to these covenants from the Bank and is currently in compliance with all required covenants. The agreement expires on June 30, 2004. Letters of Credit issued with an expiration beyond June 30, 2004 are required to be 100% secured by cash. At December 31, 2003, the Company had not exercised its conversion option and no amounts were outstanding under the revolving line of credit.

9. Stock Compensation Plans

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The Company has two employee stock option plans: the 1985 Incentive Stock Option Plan, and the 1996 Equity Incentive Plan. Both plans were approved by stockholders. These plans provide that the Board of Directors may grant options to purchase the Company's common stock to key employees of the Company. Incentive 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.

Through December 31, 2003, the Company has outstanding under its 1996 Equity Incentive Plan, non-qualified stock options held by the unaffiliated directors of the Company for the purchase of common stock at an average price of \$4.61 per share. The options may be exercised, subject to certain vesting requirements, for periods up to ten years from the date of issue. The Company may no longer award options under any plans other than the 1996 Equity Incentive Plan.

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SPIRE CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)

December 31, 2003, 2002 and 2001

A summary of the activity of these plans follows:

	Number of Shares	Weighted Average Exercise Price
Outstanding, December 31, 2000	593,870	\$ 2.99
Granted	25,000	\$ 5.72
Exercised	(50,836)	\$ 1.97
Canceled	(35,874)	\$ 2.96
Outstanding, December 31, 2001	532,160	\$ 3.19
Granted	269,750	\$ 3.80
Exercised	(23,000)	\$ 2.08
Canceled	(75,200)	\$ 2.98
Outstanding, December 31, 2002	703,710	\$ 3.48
Granted	34,000	\$ 2.39
Exercised	(1,000)	\$ 1.32
Canceled/expired	(25,382)	\$ 3.56
Options Outstanding at December 31, 2003	711,328	\$ 3.44
Options Exercisable at December 31, 2003	414,653	\$ 3.33

The following table summarizes information about stock options outstanding at December 31, 2003:

Range of Exercise Price	Options Outstanding			Options Exercisable	
	Number Outstanding	Weighted Average Remaining Contractual Life	Weighted Average Exercise Price	Number Exercisable	Weighted Average Exercise Price
\$0.79 to \$1.59	4,000	3.7 years	\$ 1.32	4,000	\$ 1.32

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\$1.59 to \$2.38	144,633	5.9 years	\$ 1.98	114,632	\$ 1.88
\$2.38 to \$3.18	162,883	6.8 years	\$ 2.58	105,672	\$ 2.56
\$3.18 to \$3.97	278,412	8.2 years	\$ 3.89	98,049	\$ 3.89
\$3.97 to \$4.76	71,400	7.5 years	\$ 4.05	52,300	\$ 4.05
\$4.76 to \$6.35	20,000	7.4 years	\$ 6.05	10,000	\$ 6.05
\$6.35 to \$7.94	30,000	4.2 years	\$ 7.94	30,000	\$ 7.94
	711,328	7.1 years	\$ 3.44	414,653	\$ 3.33

There were 1,332,305 shares reserved for issuance under all plans at December 31, 2003.

10. Acquisition

On May 23, 2003, the Company acquired from Stratos Lightwave, Inc. (Stratos) all of the ownership interests of Bandwidth Semiconductor, LLC (Bandwidth), a Delaware limited liability company, located in Hudson, New Hampshire. Bandwidth is a compound semiconductor foundry providing material and device fabrication services to defense, telecommunications and biomedical instrument industries.

Prior to December 30, 1999, Bandwidth had been the Company's optoelectronics division, until it was sold to Stratos for a total of \$12,950,000 in cash in 1999. On May 23, 2003, Bandwidth was re-acquired by the Company. The Company now owns 100% of the ownership interest of Bandwidth and the results of operations have been included herein since the date of the acquisition. Prior to the acquisition, Bandwidth was a wholly owned subsidiary of Stratos.

The total purchase price was \$954,351 in cash, including related acquisition costs of \$229,385, and liabilities assumed of \$3,044,244. In connection with the acquisition, the Company assumed an unrelated party capital lease with GE Capital that Bandwidth had entered into to finance the purchase of a wafer production reactor. The consideration from the Company to Stratos also included the release and forgiveness from all future obligations of Bandwidth and Stratos in connection with a sublease agreement with the Company dated December 29, 1999 and expiring on November 30, 2005 for approximately 21,275 square-feet of space previously occupied by Bandwidth in Bedford, Massachusetts, that is now vacant. The Company's acquisition of Bandwidth did not include the building in Hudson, New Hampshire occupied by Bandwidth.

Table of Contents**SPIRE CORPORATION AND SUBSIDIARIES****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)****December 31, 2003, 2002 and 2001**

The total purchase price of \$954,351 was allocated based on management's estimated fair value of the assets acquired and liabilities assumed, is summarized is as follows:

Current assets	\$ 402,796
Property and equipment	3,595,799
Reactor capital lease	(1,430,311)
Accrued lease obligation - related party	(1,247,241)
Other liabilities	(366,692)
	<hr/>
Total cash paid	<u>\$ 954,351</u>

The following unaudited pro forma information assumes that the acquisition of Bandwidth had been completed as of the beginning of 2003 and 2002, respectively:

	Year Ended December 31,	
	2003	2002
	<hr/> (unaudited) <hr/>	
Revenue	\$ 16,395,389	\$ 16,973,902
Net loss	\$ (1,308,248)	\$ (2,435,447)
Loss per share	\$ (0.19)	\$ (0.36)
Weighted average number of common and common equivalent shares outstanding	6,760,394	6,755,660

The pro forma financial information is not necessarily indicative of the results to be expected in the future as a result of the acquisition of Bandwidth.

11. Sale of a License

In October 2002, the Company sold an exclusive patent license for a hemodialysis split-tip catheter to Bard Access Systems, Inc. (Bard), a wholly owned subsidiary of C. R. Bard, Inc., in exchange for \$5,000,000 upon the execution of the agreement, with another \$5,000,000 due upon the earlier to occur of: (a) the date of the first commercial sale of a licensed product by Bard; or (b) no more than 18 months after signing.

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The agreement further provides for two additional contingent cash payments of \$3,000,000 each upon the completion of certain milestones by Bard in 2004 and 2005. Bard has the right to cancel the agreement at any time subsequent to the second payment. There can be no assurances that these milestones will be attained and attainment is beyond the control of the Company. During the year ended December 31, 2002, the Company recorded the initial payment under the agreement, resulting in a gain of \$4,464,929, net of direct costs. Due to the potential length of time between the first and second payments and the cancellation provisions within the agreement, the Company did not record the potential remaining payments at that time. During June 2003, in accordance with the agreement, the Company received notification from Bard of the first commercial sale, collected the \$5,000,000 payment due and recorded a gain of \$4,989,150, net of direct costs. These gains have been recorded in the accompanying consolidated statements of operations for the years ended December 31, 2003 and 2002, respectively. The Company believes that the sale of the license does not reflect the day-to-day operations of the Company. Therefore, the net proceeds received has been classified under investing activities in the consolidated statements of cash flows for the years ended December 31, 2003 and December 31, 2002, respectively.

In conjunction with the sale, the Company received a sublicense, which permits the Company to continue to manufacture and market hemodialysis catheters for the treatment of chronic kidney disease. In addition, the Company granted Bard a right of first refusal should the Company seek to sell the catheter business.

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SPIRE CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)

December 31, 2003, 2002 and 2001

12. Income Taxes

A summary of the components of income tax expense (benefit) attributable to continuing operations is as follow:

	2003		
	Current	Deferred	Total
Federal	\$	\$ 27,200	\$ 27,200
State	1,432	4,800	6,232
Total	\$ 1,432	\$ 32,000	\$ 33,432
	2002		
	Current	Deferred	Total
Federal	\$ 372,000	\$ (116,000)	\$ 256,000
State	76,000		76,000
Total	\$ 448,000	\$ (116,000)	\$ 332,000
	2001		
	Current	Deferred	Total
Federal	\$ (20,000)		\$ (20,000)
State	7,000		7,000
Total	\$ (13,000)		\$ (13,000)

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

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	<u>2003</u>	<u>2002</u>	<u>2001</u>
Income tax expense (benefit) at statutory rate	\$ 14,404	\$ 896,000	\$ (721,477)
State income taxes net of federal income tax benefit	2,656	51,000	4,620
Increase (decrease) in valuation allowance related to income tax expense		(745,000)	674,065
Permanent differences	17,207	15,000	12,701
Utilization of tax credit carryforwards			
Expiration of foreign tax credits		41,000	
Other	(835)	74,000	17,091
Total	\$ 33,432	\$ 332,000	\$ (13,000)

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

	<u>2003</u>	<u>2002</u>
Deferred tax assets:		
Accounts receivable	\$ 114,501	\$ 160,000
Accruals	532,259	257,000
Inventories	93,875	59,000
Property and equipment		84,000
General business credit carryforwards	6,781	
Alternative minimum tax credit carryforwards	267,966	226,000
Foreign tax credit	34,132	18,000
Total gross deferred tax assets	1,049,514	804,000
Valuation allowance	(508,772)	(688,000)
Deferred tax liabilities:		
Depreciation	(456,742)	
Total gross deferred tax liabilities	(456,742)	
Net deferred tax assets	\$ 84,000	\$ 116,000

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SPIRE CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)

December 31, 2003, 2002 and 2001

The net change in the total valuation allowance for the periods ended December 31, 2003 and 2002 was a decrease of \$179,228 and \$950,493, respectively.

13. Commitments

Letters of Credit

Outstanding letters of credit totaled \$663,000 at December 31, 2003. The letters of credit principally secure performance obligations, and allow holders to draw funds up to the face amount of the letter of credit if the Company does not perform as contractually required. These letters of credit expire through 2005 and are 100% secured by cash.

Property Under Capital Leases and Lease Commitments

At December 31, 2003, the Company had capital leases in effect for a building and fabrication equipment. The Company also had operating leases for office space and other miscellaneous items.

The components of capitalized costs and carrying value of the property under capital leases were as follows:

	<u>2003</u>
Unrelated party capital lease:	
Equipment	\$ 880,927
Less: accumulated depreciation	(102,775)
	<u>\$ 778,152</u>
	<u>2003</u>
Related party capital lease:	

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Hudson, New Hampshire building	\$ 3,390,397
Less: accumulated depreciation	(395,546)
	<u>\$ 2,994,851</u>

At December 31, 2003, future minimum lease payments for the period ended are as follows:

	Unrelated Party Capital Lease	Related Party Capital Lease	Unrelated Party Operating Leases	Related Party Operating Lease
2004	\$ 436,932	\$ 618,750	\$ 120,143	\$ 1,065,997
2005	436,932	727,500	57,792	977,164
2006	495,655	870,000	38,814	
2007		1,102,500	5,638	
2008		495,260		
	<u>1,369,519</u>	<u>3,814,010</u>	<u>\$ 222,387</u>	<u>\$ 2,043,161</u>
Less amount representing interest	(146,552)	(611,374)		
Present value of minimum lease payments	1,222,967	3,202,636		
Less current portion	(374,602)	(406,289)		
Long-term portion of capital lease obligation	<u>\$ 848,365</u>	<u>\$ 2,796,347</u>		

Unrelated Party Capital Lease

In September 2001, Bandwidth Semiconductor, LLC (Bandwidth) entered into an agreement with GE Capital Leasing Corp, for the lease of a reactor for its wafer production line. The lease is accounted for as a capital lease. Under the lease agreement, the Company is making monthly payments of \$36,000. After the initial three-year period ending in September 2004, the lease allows for an additional two-year extension. The Company expects to extend the lease term for the additional two years to September 2006. The lease includes a residual value guarantee of \$204,000 at the end of extended period. Interest costs were assumed at 7%. For the year ended December 31, 2003, interest expense was \$47,000.

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SPIRE CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)

December 31, 2003, 2002 and 2001

Related Party Capital Lease

In conjunction with the acquisition of Bandwidth by the Company, SPI-Trust, a Trust of which Roger G. Little, Chairman of the Board, Chief Executive Officer and President of the Company, is sole trustee and principal beneficiary, purchased from Stratos the building that Bandwidth occupies in Hudson, New Hampshire for \$3.7 million. Subsequently, the Company entered into a lease for the building (90,000 square-foot) with SPI-Trust whereby the Company will pay \$4.1 million to the SPI-Trust over an initial five-year term expiring in 2008 with a Company option to extend for five years. The lease agreement does not provide for a transfer of ownership at any point. Interest costs were assumed at 7%. For the year ended December 31, 2003, interest expense was \$138,000. This lease has been classified as a related party capital lease and a summary of payments (including interest) follows:

Year	Rate Per Square Foot	Annual Rent	Monthly Rent
Year 1	\$ 6.00	\$ 540,000	\$ 45,000
Year 2	7.50	675,000	56,250
Year 3	8.50	765,000	63,750
Year 4	10.50	945,000	78,750
Year 5	13.50	1,215,000	101,250
		\$ 4,140,000	

Unrelated Party Operating Leases

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

Related Party Operating Lease

The Company subleases 74,000 square-feet in a building leased by Mykrolis Corporation, who in turn leases the building from a Trust of which Roger G. Little, Chairman of the Board, Chief Executive Officer and President of the Company, is sole trustee and principal beneficiary. The Company believes that the terms of the third-party sublease are commercially reasonable. The 1985 sublease originally was for a period of ten years, was extended for a five-year period expiring on November 30, 2000 and was further extended for a five-year period expiring on November 30, 2005. The agreement provides for minimum rental payments plus annual increases linked to the consumer price index. Rent expense under this sublease for the year ended December 31, 2003 was \$855,000, net of \$211,000 of sublet income received from Bandwidth

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prior to its acquisition (the Company sublet a portion of the building to Bandwidth prior to its acquisition by the Company). In connection with this sublease, the Company is invoiced and pays certain Trust related expenses, including building maintenance and insurance. The Company invoices the Trust on a monthly basis and the Trust reimburses the Company for all such costs. At December 31, 2003 and 2002, \$102,000 and \$85,000, respectively, were due from the Trust. These amounts were fully paid subsequent to December 31, 2003 and 2002, respectively.

In conjunction with the acquisition of Bandwidth by the Company, the Company released Bandwidth from the lease agreement that had existed between Bandwidth and the Company. In November 2001, Bandwidth, under its previous owner, abandoned the space being subleased from the Company in Bedford, Massachusetts, to move to a new building and wafer fabrication lab in Hudson, New Hampshire. At that time, there were 48 months left on the lease. Subsequent to the move to Hudson, New Hampshire, Bandwidth was unable to sublease the Bedford, Massachusetts space, and was paying the Company for the unused space. In conjunction with the acquisition of Bandwidth in May 2003, the Company released Bandwidth from the remaining lease payments. However, the Company continues to be obligated to Mykrolis Corporation for the entire amount of the remaining lease agreement. As a result the present value of the remaining lease obligation associated with the unused space was recorded as an assumed liability of \$1,247,241 in the purchase accounting. As of December 31, 2003, the remaining lease obligation is \$965,476, which is reflected as accrued lease obligation - related party in the December 31, 2003 consolidated balance sheet. The amount due beyond one year has been reflected in long term liabilities. The difference between the actual rent payment and the discounted rent payment will be accreted to the consolidated statements of operations as interest expense. Interest of 6.28% has been assumed on this obligation. For the year ended December 31, 2003, interest expense was \$33,000.

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SPIRE CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)

December 31, 2003, 2002 and 2001

Agreement with BP Solarex

On October 8, 1999, the Company entered into an Agreement with BP Solarex (BPS) in which BPS agreed to purchase certain production equipment built by the Company, for use in the Company's Chicago factory (Spire Solar Chicago) and in return the Company agreed to purchase solar cells of a minimum of two megawatts per year over a five-year term for a fixed fee from BPS (the Purchase Commitment). BPS has the right to reclaim the equipment should the Company not meet its obligations in the Purchase Commitment. The proceeds from the sale of the production equipment purchased by BPS have been classified as an unearned purchase discount in the accompanying consolidated balance sheets. The Company will amortize this discount as a reduction to cost of sales as it purchases solar cells from BPS. During the quarter ended September 30, 2003, the Company and BPS retroactively amended the agreement to include all purchases of solar modules, solar systems, inverter systems and other system equipment purchased by the Company from BPS in the purchase commitment calculation. Amortization of the purchase discount amounted to \$39,241 for the year ended December 31, 2003. The production equipment has been classified as a component of fixed assets in the accompanying consolidated balance sheets. Depreciation amounted to \$277,099 for the year ended December 31, 2003.

In addition, the agreement contains a put option for BPS to have the Company create a separate legal entity for Spire Solar Chicago and for BPS to convert the value of the equipment and additional costs, as defined, into equity of the new legal entity. The percentage ownership in the joint venture would be determined based on the cumulative investments by BPS and the Company.

The amended agreement also allows the Company to terminate the agreement on 30 days notice in consideration for a termination payment based on the aggregate amount of Spire purchases of BPS products and the fair market value of the production equipment purchased by BPS at the time of the termination election. As of December 31, 2003, the Company has no intention of terminating the agreement.

14. 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. During the third quarter of 2001, the Company suspended the 401(k) Plan matching contributions. No matching contributions have been made to the plan for the years ended December 31, 2003 and 2002, respectively. Expense recognized under the plan in 2003, 2002 and 2001 was \$0, \$0 and \$65,000, respectively.

15. Earnings (Loss) Per Share

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The following table provides a reconciliation of the denominators of diluted earnings (loss) per share computations for the year ended December 31:

	2003	2002	2001
Weighted average number of common shares outstanding	6,764,394	6,749,783	6,694,933
Add: net additional common shares upon exercise of common stock options	105,274	92,288	
Adjusted weighted average common shares outstanding	6,869,668	6,842,071	6,694,933

For the years ended December 31, 2003, 2002 and 2001, 404,916, 340,651 and 336,415 shares, respectively, of common stock issuable under stock options were not included in the calculation of diluted earnings per share because their effects would be anti-dilutive. Of those amounts, 404,916, 340,651 and 51,542 shares for the years ended December 31, 2003, 2002 and 2001, respectively, had exercise prices per share that exceeded the average market price of the Company's common stock for those periods.

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SPIRE CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)

December 31, 2003, 2002 and 2001

16. Legal Matters

In May 1985, Electronics Space Systems Corporation (ESSCO) sued the Company in Middlesex Superior Court, Massachusetts to recover for alleged breach of contract, breach of implied covenant of good faith dealing and related claims in connection with ESSCO 's allegation that the Company had violated certain contractual obligations and a partnership agreement for marketing photovoltaic products in China and certain other markets. The Company denied liability and filed counterclaims against ESSCO. In a trial on liability, a jury found that both the Company and ESSCO were liable for certain conduct. After further proceedings, including a separate trial on damages, and the filing of a number of motions, the court entered judgment in 2002 in favor of ESSCO against the Company for \$301,000 plus interest. The court also entered judgment in favor of the Company against ESSCO for \$228,500 plus interest. Both the Company and ESSCO filed notices of appeal. Thereafter the parties negotiated a settlement whereby the Company made a single payment of \$135,000 to ESSCO, which was accrued as of December 31, 2002. The payment was made during 2003 and all claims in the action were dismissed.

The Company has been named as a defendant in 69 cases filed from August 2001 to July 2003 in state courts in Texas by persons claiming damages from the use of allegedly defective mechanical heart valves coated by a process licensed by the Company to St. Jude Medical, Inc., the valve manufacturer, which has also been named as a defendant in the cases. In June 2003, a judge in a state court in Harris County, Texas agreed to grant the Company 's motion for summary judgment based upon the principle of federal preemption with regard to 68 of those cases and to order that the cases against the Company be dismissed with prejudice. An order to this effect was signed in late July 2003. The remaining case is still pending, and due to aspects of its fact situation is not subject to the principle of federal preemption. From August 2003 to date, a total of seven new cases were filed against the Company in courts in Harris County. The plaintiffs whose cases were dismissed have filed appeals with the Texas appellate court. A decision on these appeals is pending and may be rendered early next year. Attorneys who represent the Company with respect to these cases in Texas do not believe at this time that the actions of a federal district court judge in Minnesota in denying St. Jude 's request for summary judgment will materially affect the Company 's position in the Texas complaints.

The Company has concluded a dispute with ATmicro Solar, Ltd., a customer of the Company. In May 2003, the customer made various claims against the Company and had requested the return of certain funds paid for equipment it had agreed to purchase from the Company. The Company paid \$75,000 to settle the dispute in 2003 upon the execution by the parties of a full and general mutual release.

From time to time, the Company is subject to legal proceedings and claims arising from the conduct of its business operations. The Company does not expect the outcome of these proceedings, either individually or in the aggregate, to have a material adverse affect on its financial position, results of operations, or cash flows.

17. Operating Segments and Related Information

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The following table presents certain operating division information in accordance with the provisions of SFAS No. 131, Disclosure about Segments of an Enterprise and Related Information .

	Solar	Solar	Spire			Total
	Equipment	Systems	Biomedical	Optoelectronics	Other	Company
<u>December 31, 2003</u>						
Net sales and revenues	\$ 5,324,688	\$ 2,005,404	\$ 6,603,767	\$ 1,869,009	\$	\$ 15,802,868
Earnings (loss) from operations	(659,382)	(1,323,647)	3,065,252	(879,334)		202,889
Identifiable assets	1,851,251	1,395,325	2,961,726	6,890,084	9,693,582	22,791,968
Capital expenditures	58,753	(3,950)	637,087	57,762	268,107	1,017,759
Depreciation	59,221	288,675	275,770	825,131	161,506	1,610,303
<u>December 31, 2002</u>						
Net sales and revenues	\$ 4,059,331	\$ 4,119,299	\$ 6,096,367	\$ 547,212	\$	\$ 14,822,209
Earnings (loss) from operations	(1,091,744)	246,836	3,432,792	(37,666)		2,550,218
Identifiable assets	1,698,601	4,309,636	2,374,982	158,617	9,230,274	17,772,110
Capital expenditures	13,873	12,891	122,437		21,762	170,963
Depreciation	97,333	277,024	211,328	3,846	174,723	764,254
<u>December 31, 2001</u>						
Net sales and revenues	\$ 5,798,593	\$ 3,686,039	\$ 4,004,607	\$ 662,549	\$	\$ 14,151,788
Earnings (loss) from operations	(590,978)	(926,803)	(699,780)	(144,863)		(2,362,424)
Identifiable assets	2,075,469	3,170,373	2,305,785	292,749	6,980,269	14,814,645
Capital expenditures	16,925	1,501,362	17,918	13,637	27,578	1,577,420
Depreciation	60,166	99,928	121,816	2,880	215,738	500,528

Table of Contents**SPIRE CORPORATION AND SUBSIDIARIES****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)****December 31, 2003, 2002 and 2001**

The following table shows net sales and revenues by geographic area (based on customer location):

	<u>2003</u>	<u>2002</u>	<u>2001</u>
Foreign	\$ 4,669,000	\$ 2,574,000	\$ 3,726,000
United States	11,134,000	12,248,000	10,426,000
	<u>\$ 15,803,000</u>	<u>\$ 14,822,000</u>	<u>\$ 14,152,000</u>

During 2003, the Company's operations were focused on three primary business areas: Spire Solar (comprised of two business units, solar equipment and solar systems), Spire Biomedical. (comprised of biomedical and biophotonics research) and optoelectronics (comprised primarily of Bandwidth Semiconductor, LLC). Spire Solar and Spire Biomedical operate out of the Company's facility in Bedford, Massachusetts. Solar systems operates out of Chicago, Illinois, and Bandwidth Semiconductor LLC operates out of the Company's facility in Hudson, New Hampshire.

The solar equipment business unit develops, manufactures and markets photovoltaic module manufacturing equipment and production lines. The Solar Systems business unit manufactures and markets solar photovoltaic systems suitable both for stand-alone emergency power back-up and for interconnection into the electric power grid. Spire Biomedical specializes in surface engineering to improve the performance of medical devices such as orthopedic implants, stents, catheters and vascular grafts. Spire Biomedical also markets two hemodialysis catheter devices for the treatment of chronic kidney disease. In research and development programs, Biophotonics has developed a strong intellectual property estate in biotechnology surface engineering, optoelectronics and photovoltaics, as well as proprietary surface treatments for medical implants. Optoelectronics provides custom compound semiconductor and thin film wafer and device fabrication services to customers in communications, biomedical and aerospace-defense industries. Each business unit 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.

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

Revenues from contracts with United States government agencies for 2003, 2002 and 2001 were \$2,393,000, \$2,482,000 and \$1,985,000, or 15%, 17% and 14% of consolidated net sales and revenues, respectively. In 2003, 2002 and 2001, export revenues were \$4,669,000, \$2,574,000 and \$3,726,000, respectively, or 30%, 17% and 26% of consolidated net sales and revenues, respectively.

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Three customers accounted for approximately 30% and 35% of the Company's gross sales during 2003 and 2002, respectively. The two largest account balances representing approximately 36% of trade account receivables at December 31, 2003 and 2002.

Table of Contents**SPIRE CORPORATION AND SUBSIDIARIES****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (CONTINUED)****December 31, 2003, 2002 and 2001****18. Quarterly Financial Data (unaudited)**

The following is a summary of the consolidated quarterly results for 2003 and 2002:

	2003			
	Three Months Ended			
	March 31	June 30	September 30	December 31
Net sales and revenues	\$ 2,959,093	\$ 3,754,921	\$ 4,073,313	\$ 5,015,541
Costs and expenses	3,740,231	4,786,279	5,705,015	6,357,604
Gain on sale of a license		4,989,150		
Earnings (loss) before income taxes	(773,709)	3,936,280	(1,699,767)	(1,420,440)
Income tax expense (benefit)		675,000	(450,000)	(191,568)
Net income (loss)	(773,709)	3,261,280	(1,249,767)	(1,228,872)
Earnings (loss) per share - basic	(0.11)	0.48	(0.18)	(0.18)
Earnings (loss) per share - diluted	(0.11)	0.48	(0.18)	(0.18)

	2002			
	Three Months Ended			
	March 31	June 30	September 30	December 31
Net sales and revenues	\$ 3,326,517	\$ 4,561,451	\$ 4,196,674	\$ 2,737,567
Costs and expenses	3,934,247	4,570,009	4,162,616	4,070,048
Gain on sale of a license				4,464,929
Earnings (loss) before income taxes	(607,730)	(8,558)	34,058	3,136,520
Income tax expense (benefit)		100	(100)	332,000
Net income (loss)	(604,692)	1,441	35,379	2,804,520
Earnings (loss) per share - basic	(0.09)	0.00	0.01	0.41
Earnings (loss) per share - diluted	(0.09)	0.00	0.01	0.41

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Item 8. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

The disclosure called for by paragraph (a) of Item 304 of Regulation S-B has been previously reported in (i) our Current Report on Form 8-K, dated December 31, 2003 and initially filed on January 7, 2004, as amended by our Current Report on Form 8-K/A filed on March 26, 2004, relating to our dismissal of KPMG LLP as our independent auditors, and (ii) our Current Report on Form 8-K, dated January 7, 2004 and filed on January 8, 2004, relating to our engagement of Vitale, Caturano & Company, P.C. as our independent auditors.

Item 8A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

As required by Rule 13a-15 under the Securities Exchange Act of 1934, as amended (the Exchange Act), the Company carried out an evaluation under the supervision and with the participation of the Company's management, including the Chief Executive Officer and President and the Financial Controller and Treasurer, of the effectiveness of the Company's disclosure controls and procedures as of December 31, 2003. In designing and evaluating the Company's disclosure controls and procedures, the Company and its management recognize that there are inherent limitations to the effectiveness of any system of disclosure controls and procedures, including the possibility of human error and the circumvention or overriding of the controls and procedures. Accordingly, even effective disclosure controls and procedures can only provide reasonable assurance of achieving their desired control objectives. Additionally, in evaluating and implementing possible controls and procedures, the Company's management was required to apply its reasonable judgment. Furthermore, in the course of this evaluation, management considered certain internal control areas, including those discussed below, in which we have made and are continuing to make changes to improve and enhance controls. Based upon the required evaluation, the Chief Executive Officer and the Financial Controller and Treasurer concluded that as of December 31, 2003 the Company's disclosure controls and procedures were effective (at the reasonable assurance level mentioned above) to ensure that information required to be disclosed by the Company in the reports it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms.

From time to time, the Company and its management have conducted and will continue to conduct further reviews and, from time to time put in place additional documentation of, the Company's disclosure controls and procedures, as well as its internal control over financial reporting. The Company may from time to time make changes aimed at enhancing their effectiveness, as well as changes aimed at ensuring that the Company's systems evolve with, and meet the needs of, the Company's business. These changes may include changes necessary or desirable to address recommendations of the Company's management, its counsel and/or its independent auditors, including any recommendations of its independent auditors arising out of their audits and reviews of the Company's financial statements. These changes may include changes to the Company's own systems, as well as to the systems of businesses that the Company has acquired or that the Company may acquire in the future and will, if made, be intended to enhance the effectiveness of the Company's controls and procedures. The Company is also continually striving to improve its management and operational efficiency and the Company expects that its efforts in that regard will from time to time directly or indirectly affect the Company's disclosure controls and procedures, as well as the Company's internal control over financial reporting.

As disclosed in our quarterly report on Form 10-QSB/A Amendment Number 2 for the quarterly period ended June 30, 2003, as amended (the Second Quarter Form 10-QSB), in connection with the initial filing of the Second Quarter Form 10-QSB, which was initially submitted prior to the completion of the required SAS 100 Review by the Company's independent auditors, the Audit Committee engaged outside counsel to conduct an investigation into the events surrounding the preparation and filing of the Second Quarter Form 10-QSB. Based on the results of that investigation, outside counsel concluded that weaknesses existed in the Company's disclosure controls and procedures and proposed an action plan designed to strengthen the Company's disclosure controls and procedures. The Audit Committee, the Board of Directors and management have begun to adopt and implement certain of those recommendations in order to strengthen the Company's disclosure controls and procedures.

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As further disclosed in the Second Quarter Form 10-QSB, subsequent to both the initial filing of the Second Quarter Form 10-QSB and Amendment No. 1 to the Second Quarter Form 10-QSB, the Company's former independent auditors, KPMG LLP, advised management and the Audit Committee by a letter dated December 24, 2003 that, in connection with KPMG's review of the financial statements of the Company for the three and six-month periods ended June 30, 2003, it noted certain matters involving internal control and its operation that it considered to be material weaknesses that constituted reportable conditions under standards established by the American Institute of Certified Public Accountants. Reportable conditions are matters coming to an independent auditors' attention that, in their judgment, relate to significant deficiencies in the design or operation of internal control and could adversely affect the organization's ability to record,

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process, summarize, and report financial data consistent with the assertions of management in the financial statements. Further, a material weakness is a reportable condition in which the design or operation of one or more internal control components does not reduce to a relatively low level the risk that errors or fraud in amounts that would be material in relation to the financial statements being audited may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions. KPMG advised management and the Audit Committee that it considered the following to constitute material weaknesses in internal control and operations: the Company's failure to adequately staff its finance group with the appropriate level of experience to effectively control the increased level of transaction activity, address the complex accounting matters and manage the increased financial reporting complexities resulting from, among other things, the acquisition of Bandwidth and the implementation of a new financial reporting system.

The Company's new independent auditor, VCC, has, in connection with its audit of the Company's consolidated financial statements for the year ended December 31, 2003, advised management and the Audit Committee by a letter dated March 18, 2004 that it also noted certain matters involving the internal control and its operation that it considered to be a material weakness under standards established by the AICPA. VCC advised management and the Audit Committee that it considered the following to constitute material weaknesses in internal control and operations: (i) the Company's failure to adequately staff its finance group with the appropriate level of experience to effectively control the increased level of transaction activity, address the complex accounting matters and manage the increased financial reporting complexities resulting from, among other things, the acquisition of Bandwidth, the implementation of a new financial reporting system and the investigation surrounding the filing and eventual restatement of the Second Quarter Form 10-QSB and (ii) the Company's current monthly close process does not mitigate the risk that material errors could occur in the books, records and financial statements, and does not ensure that those errors would be detected in a timely manner by the Company's employees in the normal course of performing their assigned functions. VCC noted that these matters were considered by it during its audit and did not modify the opinion expressed in its independent auditor's report dated March 18, 2004.

The Company is currently assessing the findings of its independent auditors. As noted above, however, the Company has made and is continuing to make changes in its controls and procedures, including its internal control over financial reporting, aimed at enhancing their effectiveness and ensuring that the Company's systems evolve with, and meet the needs of, the Company's business. As further noted above, the Company is also continually striving to improve its management and operational efficiency and the Company expects that its efforts in that regard will from time to time directly or indirectly affect the Company's controls and procedures, including its internal control over financial reporting. For example, the Company has recently added to its accounting staff and expects to hire additional professionals and the Company has arranged for additional compliance training for its staff. The Company commenced a search for a new chief financial officer and is now in the final stages of hiring a permanent chief financial officer with the appropriate experience and background to manage the diverse and complex financial issues which may arise in the Company's business. The Company is also continuing its efforts to upgrade its information technology capabilities. It has completed the implementation of a common accounting system at all of its business units and is working to complete integration of the systems at remote sites with its headquarters location.

Changes in Internal Control Over Financial Reporting

There was no change in the Company's internal control over financial reporting that occurred during the fourth fiscal quarter of 2003 that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting.

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PART III

Item 9. Directors and Executive Officers of the Registrant; Compliance with Section 16(a) of the Exchange Act

Information concerning the directors and executive officers of the Company is set forth under Election of Directors and Executive Officers in the Proxy Statement for the Special Meeting in Lieu of 2004 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.

The Company has a Code of Business Conduct and Ethics (the Code) that applies to its principal executive officer, principal financial officer and principal accounting officer or controller. 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 the Company files with the SEC and in other public communications made by the Company, (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.

A copy of the Code is filed as an exhibit to this Annual Report on Form 10-KSB.

Item 10. Executive Compensation

Information concerning executive compensation is set forth under Compensation of Officers and Directors in the Proxy Statement and is incorporated herein by reference.

Item 11. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

Information concerning security ownership of certain beneficial owners and management is set forth under Ownership of Securities in the Proxy Statement and is incorporated herein by reference. Information regarding equity compensation plan information is set forth under Equity Compensation Plan Information under Part III, Item 5 of this Annual Report on Form 10-KSB and is incorporated herein by reference.

Item 12. Certain Relationships and Related Transactions

Information concerning certain relationships and related transactions is set forth under Other Transactions and Relationships in the Proxy Statement and is incorporated herein by reference.

Item 13. Exhibits and Reports on Form 8-K

(1) Exhibits

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

- 3(a) Articles of Organization as amended, incorporated by reference to Exhibit 3(a) to the Company's Form 10-QSB for the quarter ended June 30, 1997
- 3(b) By-Laws, as amended, incorporated by reference to Exhibit 3(b) to the Company's Form 10-K for the year ended December 31, 1989
- 10(a) Sublease Agreement with Millipore Corporation as landlord for facility at Bedford, Massachusetts dated November 25, 1985, incorporated by reference to Exhibit 10(a) to the Company's Form 10-K for the year ended December 31, 1985 (1985 10-K)
- 10(b) Amendment to Sublease Agreement with Millipore Corporation as landlord for facility at Bedford, Massachusetts dated December 30, 1999, incorporated by reference to Exhibit 10(b) to the Company's Form 10-KSB for the year ended December 31, 1999 (1999 10-KSB)

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10(c)	Sublease Agreement with Methode Electronics, Inc. as tenant for a portion of the facility at Bedford, Massachusetts dated December 29, 1999, incorporated by reference to Exhibit 10(c) to the 1999 Form 10-KSB
10(d)	Asset Purchase Agreement dated as of November 18, 1999 with Methode Electronics, Inc. and Methode Massachusetts, Inc., incorporated by reference to Exhibit 1 to the Company's Form 8-K dated December 29, 1999
10(e)	Employment Agreement with Roger G. Little dated as of January 1, 2002, incorporated by reference to Exhibit 10(e) to the Company's Form 10-KSB for the year ended December 31, 2001 (2001 10-KSB)
10(f)	Deferred Compensation Plan with Roger G. Little dated as of January 1, 2002, incorporated by reference to Exhibit 10(f) to 2001 Form 10-KSB
10(g)	Spire Corporation 1985 Incentive Stock Option Plan incorporated by reference to Exhibit 10(d) to the Company's Form 10-K for the year ended December 31, 1984 (1984 10-K)
10(h)	Spire Corporation 401(k) Profit Sharing Plan (filed herewith)
10(i)	Spire Corporation 1996 Equity Incentive Plan, incorporated by reference to Exhibit 99 to Registration Statement 333-22223, filed February 21, 1997
10(j)	Purchase Agreement dated May 23, 2003 with Stratos Lightwave and Bandwidth Semiconductor, LLC incorporated by reference to Exhibit 10(h) to the Company's Form 10-QSB for the quarter ended June 30, 2003
10(k)	Lease Agreement dated May 23, 2003 by and between Roger G. Little, Trustee of SPI-Trust as Landlord and Spire Corporation as Tenant incorporated by reference to Exhibit 10(i) to the Company's Form 10-QSB for the quarter ended June 30, 2003
11	Statement Regarding Computation of Per Share Earnings (Loss) (filed herewith)
14	Code of Business Conduct and Ethics (filed herewith)
21	Subsidiaries of the Registrant (filed herewith)
23(a)	Independent Auditor's Consent (filed herewith)
23(b)	Independent Auditor's Consent (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
31.2	Certification of the Financial Controller and Treasurer (Principal Financial and Accounting Officer) pursuant to §302 of the Sarbanes-Oxley Act of 2002
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
32.2	Certification of the Financial Controller and Treasurer (Principal Financial and Accounting Officer) pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002

(2) Reports on Form 8-K

There were no reports on Form 8-K that were filed by the Registrant in the quarter ended December 31, 2003.

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Item 14. Principal Accountant Fees and Services

Information concerning principal accountant fees and services is set forth under the captions "Audit Fees", "Audit-Related Fees", "Tax Fees" and "All Other Fees" in the Proxy Statement.

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

By: /s/ Roger G. Little March 30, 2004

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.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Roger G. Little</u> Roger G. Little	Chairman of the Board, Chief Executive Officer and President	March 30, 2004
<u>/s/ Gregory G. Towle</u> Gregory G. Towle	Financial Controller and Treasurer (Principal Financial and Accounting Officer)	March 30, 2004
<u>/s/ Udo Henseler</u> Udo Henseler	Director	March 30, 2004
<u>/s/ David R. Lipinski</u> David R. Lipinski	Director	March 30, 2004
<u>/s/ Michael J. Magliochetti</u>	Director	March 30, 2004

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Michael J. Magliochetti

/s/ Guy L. Mayer

Director

March 30, 2004

Guy L. Mayer

/s/ Roger W. Redmond

Director

March 30, 2004

Roger W. Redmond

/s/ John A. Tarello

Director

March 30, 2004

John A. Tarello

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EXHIBIT INDEX

<u>Exhibit</u>	<u>Description</u>
10(h)	Spire Corporation 401(k) Profit Sharing Plan
11	Statement Regarding Computation of Per Share Earnings (Loss)
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