



State of West Virginia  
 Department of Administration  
 Purchasing Division  
 2019 Washington Street East  
 Post Office Box 50130  
 Charleston, WV 25305-0130

# Request for Quotation

RFQ NUMBER
DPS0716

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
BUYER 32 304-558-0492

\*709020254 724-772-7433

TESCAN USA INC  
 508 THOMSON PARK DRIVE

CRANBERRY TWP PA 16066-6425

WEST VIRGINIA STATE POLICE

4124 KANAWHA TURNPIKE  
 SOUTH CHARLESTON, WV  
 25309 304-746-2141

VENDOR

SHIP TO

DATE PRINTED 12/12/2006	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
BID OPENING DATE: 12/28/2006		BID OPENING TIME 01:30PM		

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
REQUEST FOR QUOTATION						
THE PURCHASING DIVISION IS SOLICITING BIDS FOR THE WEST VIRGINIA STATE POLICE TO PROVIDE ONE (1) SCANNING ELECTRON MICROSCOPE SYSTEM AS PER THE ATTACHED DOCUMENTATION.						
ATTACHMENTS: 1. SPECIFICATIONS 2. AFFIDAVIT						
0001	1	LS		490-29	\$ 133,955.00	\$ 133,955.00
ELECTRON MICROSCOPY EQUIPMENT						
VENDOR PREFERENCE CERTIFICATE						
CERTIFICATION AND APPLICATION* IS HEREBY MADE FOR PREFERENCE IN ACCORDANCE WITH WEST VIRGINIA CODE, 5A-3-37 (DOES NOT APPLY TO CONSTRUCTION CONTRACTS).						
A. APPLICATION IS MADE FOR 2.5% PREFERENCE FOR THE REASON CHECKED:						
<input type="checkbox"/> BIDDER IS AN INDIVIDUAL RESIDENT VENDOR AND HAS RESIDED CONTINUOUSLY IN WEST VIRGINIA FOR FOUR (4) YEARS IMMEDIATELY PRECEDING THE DATE OF THIS CERTIFICATION; OR  <input type="checkbox"/> BIDDER IS A PARTNERSHIP, ASSOCIATION OR CORPORATION RESIDENT VENDOR AND HAS MAINTAINED ITS HEAD-QUARTERS OR PRINCIPAL PLACE OF BUSINESS CONTINUOUSLY I						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>A. D. Owen</i>	TELEPHONE 724-772-7433	DATE 12-22-06
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TITLE Vice President	FEIN 25-1576402	ADDRESS CHANGES TO BE NOTED ABOVE
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RECEIVED DEC 14 2006



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<p>WEST VIRGINIA FOR FOUR (4) YEARS IMMEDIATELY PRECEDING THE DATE OF THIS CERTIFICATION; OR 80% OF THE OWNERSHIP INTEREST OF BIDDER IS HELD BY ANOTHER INDIVIDUAL, PARTNERSHIP, ASSOCIATION OR CORPORATION RESIDENT VENDOR WHO HAS MAINTAINED ITS HEADQUARTERS OR PRINCIPAL PLACE OF BUSINESS CONTINUOUSLY IN WEST VIRGINIA FOR FOUR (4) YEARS IMMEDIATELY PRECEDING THE DATE OF THIS CERTIFICATION; OR</p> <p>( ) BIDDER IS A CORPORATION NONRESIDENT VENDOR WHICH HAS AN AFFILIATE OR SUBSIDIARY WHICH EMPLOYS A MINIMUM OF ONE HUNDRED STATE RESIDENTS AND WHICH HAS MAINTAINED ITS HEADQUARTERS OR PRINCIPAL PLACE OF BUSINESS WITHIN WEST VIRGINIA CONTINUOUSLY FOR THE FOUR (4) YEARS IMMEDIATELY PRECEDING THE DATE OF THIS CERTIFICATION.</p> <p>B. APPLICATION IS MADE FOR 2.5% PREFERENCE FOR THE REASON CHECKED:</p> <p>( ) BIDDER IS A RESIDENT VENDOR WHO CERTIFIES THAT, DURING THE LIFE OF THE CONTRACT, ON AVERAGE AT LEAST 75% OF THE EMPLOYEES WORKING ON THE PROJECT BEING BID ARE RESIDENTS OF WEST VIRGINIA WHO HAVE RESIDED IN THE STATE CONTINUOUSLY FOR THE TWO YEARS IMMEDIATELY PRECEDING SUBMISSION OF THIS BID;</p> <p>OR</p> <p>( ) BIDDER IS A NONRESIDENT VENDOR EMPLOYING A MINIMUM OF ONE HUNDRED STATE RESIDENTS OR IS A NONRESIDENT VENDOR WITH AN AFFILIATE OR SUBSIDIARY WHICH MAINTAINS ITS HEADQUARTERS OR PRINCIPAL PLACE OF BUSINESS WITHIN WEST VIRGINIA EMPLOYING A MINIMUM OF ONE HUNDRED STATE RESIDENTS WHO CERTIFIES THAT, DURING THE LIFE OF THE CONTRACT, ON AVERAGE AT LEAST 75% OF THE EMPLOYEES OR BIDDERS' AFFILIATE'S OR SUBSIDIARY'S EMPLOYEES ARE RESIDENTS OF WEST VIRGINIA</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>A. D. Owens</i>	TELEPHONE 724-772-7433	DATE 12-22-06
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TITLE VICE PRESIDENT	FEIN 25-1576402	ADDRESS CHANGES TO BE NOTED ABOVE
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<p>WHO HAVE RESIDED IN THE STATE CONTINUOUSLY FOR THE TWO YEARS IMMEDIATELY PRECEDING SUBMISSION OF THIS BID.</p> <p>BIDDER UNDERSTANDS IF THE SECRETARY OF TAX &amp; REVENUE DETERMINES THAT A BIDDER RECEIVING PREFERENCE HAS FAILED TO CONTINUE TO MEET THE REQUIREMENTS FOR SUCH PREFERENCE, THE SECRETARY MAY ORDER THE DIRECTOR OF PURCHASING TO: (A) RESCIND THE CONTRACT OR PURCHASE ORDER ISSUED; OR (B) ASSESS A PENALTY AGAINST SUCH BIDDER IN AN AMOUNT NOT TO EXCEED 5% OF THE BID AMOUNT AND THAT SUCH PENALTY WILL BE PAID TO THE CONTRACTING AGENCY OR DEDUCTED FROM ANY UNPAID BALANCE ON THE CONTRACT OR PURCHASE ORDER.</p> <p>BY SUBMISSION OF THIS CERTIFICATE, BIDDER AGREES TO DISCLOSE ANY REASONABLY REQUESTED INFORMATION TO THE PURCHASING DIVISION AND AUTHORIZES THE DEPARTMENT OF TAX AND REVENUE TO DISCLOSE TO THE DIRECTOR OF PURCHASING APPROPRIATE INFORMATION VERIFYING THAT BIDDER HAS PAID THE REQUIRED BUSINESS TAXES, PROVIDED THAT SUCH INFORMATION DOES NOT CONTAIN THE AMOUNTS OF TAXES PAID NOR ANY OTHER INFORMATION DEEMED BY THE TAX COMMISSIONER TO BE CONFIDENTIAL.</p> <p>UNDER PENALTY OF LAW FOR FALSE SWEARING (WEST VIRGINIA CODE 61-5-3), BIDDER HEREBY CERTIFIES THAT THIS CERTIFICATE IS TRUE AND ACCURATE IN ALL RESPECTS; AND THAT IF A CONTRACT IS ISSUED TO BIDDER AND IF ANYTHING CONTAINED WITHIN THIS CERTIFICATE CHANGES DURING THE TERM OF THE CONTRACT, BIDDER WILL NOTIFY THE PURCHASING DIVISION IN WRITING IMMEDIATELY.</p> <p style="text-align: right;">BIDDER: <u>Tescan USA Inc.</u></p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>[Signature]</i>	TELEPHONE 724-772-7433	DATE 12-22-06
TITLE VICE PRESIDENT	FEIN 25-1576402	ADDRESS CHANGES TO BE NOTED ABOVE

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			DATE: 12-22-2006			
			SIGNED: <i>[Signature]</i>			
			TITLE: Vice President			
<p>* CHECK ANY COMBINATION OF PREFERENCE CONSIDERATION(S) IN EITHER "A" OR "B", OR BOTH "A" AND "B" WHICH YOU ARE ENTITLED TO RECEIVE. YOU MAY REQUEST UP TO THE MAXIMUM 5% PREFERENCE FOR BOTH "A" AND "B". (REV. 12/00)</p> <p>NOTICE</p> <p>A SIGNED BID MUST BE SUBMITTED TO:</p> <p>DEPARTMENT OF ADMINISTRATION          PURCHASING DIVISION          BUILDING 15          2019 WASHINGTON STREET, EAST          CHARLESTON, WV 25305-0130</p> <p>THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:</p> <p>SEALED BID</p> <p>BUYER:      RON PRICE</p> <p>RFQ. NO.:      DPS0716</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS			
SIGNATURE <i>[Signature]</i>	TELEPHONE 724-772-7433	DATE 12-22-06	
TITLE Vice President	FEIN 25-1576402	ADDRESS CHANGES TO BE NOTED ABOVE	

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**Specifications for SEM/EDS System:**

- I. Scanning Electron Microscope (SEM)
  1. The microscope and all required components must operate from a standard 120V power source and require no compressed gas or water cooling system.
  2. Accelerating Voltage: 200V to 30kV, in 10V increments
  3. Resolution: 3.0nm (SE mode at 30kV)
  4. Magnification: 4x to 500,000x
  5. Electron Optics: The column shall be fully computer-controlled (no mechanical centering controls) with automatic filament saturation, emission current adjustment, gun alignment, electronic aperture alignment, brightness, contrast, focus, and stigmation. Automatic setting of optimum beam diameter as a function of magnification.
  6. Sample Chamber: The chamber must have multiple (11) ports for simultaneous mounting of various detectors including SE, BSE, EDX, chamber camera, and picoammeter.
  7. Sample Stage: The sample stage must be capable of 5 axes of movement (x, y, z, tilt, and rotation). The stage must be motorized and computer controlled in x, y, z, and rotation and capable of unattended, automated GSR analysis of at least nine standard stubs (~1/2" diameter) or three larger stubs (~3/4" diameter). The stage must be equipped with a touch alarm. It must be designed so that samples may be exchanged without contact with the interior of the chamber.
  8. Detectors: Secondary (SE) and Backscatter electron (BSE) detectors, fitted with permanent single crystal YAG scintillators. Must have a picoammeter and infrared chamberscope, both interfaced with the SEM. Should include signal inputs for at least four detectors.
  9. Vacuum System: Must include turbomolecular and rotary pump, both with gauges capable of monitoring and displaying high vacuum levels in user selectable pressure units.
  10. Computer System: The system must be fully computer controlled using the Windows XP Professional system and include this system. Minimum PC requirements include Intel Pentium 4, 3.0 GHz HT, 512 MB RAM, 80G hard drive, CD-RW/DVD-R drive, two Ethernet network interface cards, 19" digital LCD display, and the Windows XP Professional System. The system must be upgradeable without requiring a service call.
  11. Image Display: The system must be able to display, capture, and archive images up to 8192 x 8192 pixels, using square pixels. It should be able to store and retrieve images in common formats (TIFF, JPEG, BMP) and be capable of storing all operating conditions as well as notes and text. The system must include an integrated image database that allows for archiving, sharing, searching, and printing of images.
  12. Remote Operation: The system must be capable of off-site monitoring, control, and operation as well as creating a log of operating data/error information that can be emailed for technical support.

13. System Diagnostics and Backups: The system must be capable of performing self-tests on both hardware and software systems. It must be able to log these tests in a format that can be emailed for technical support. The system must also include the capability to automatically backup all system and configuration files.
14. User Accounts: The system must be capable of multiple user accounts that can allow each user to save configuration files and working conditions that can be easily recalled. These accounts should be password protected.
15. Filaments: The system must include a box of replacement filaments.

## II. Energy Dispersive X-ray Analysis System (EDS):

1. Detector: The EDX system must include a detector that has a resolution of at least 137eV at Mn Ka and must be capable of detecting Boron. It must have a digital pulse processor with at least six processing time constants and a maximum throughput of 50,000 counts per second. The system must be capable of in-situ detector crystal re-conditioning and de-icing.
2. Software:
  - a. The system must include automatic peak identification for qualitative analysis and standardless quantitative analysis. It must be capable of collecting full spectrum X-ray maps and perform analysis from reconstructed spectra.
  - b. The system must be capable of controlling the SEM column and stage through a single TCP/IP interface.
  - c. The system must include software for automated, unattended analysis of multiple GSR samples that can be recalled by the operator.
  - d. The system must allow the user to relocate, re-image, and reanalyze any particle detected during automated analysis to allow for confirmation of both morphology and composition. A schematic of the stage must be included that shows the user defined samples in an adjustable perspective.
  - e. The system must be capable of periodically collecting video and x-ray data for the purpose of showing stability or detecting any changes in the electron beam or performance of the EDS system over the course of analyzing a sample. A standard sample must be supplied that allows for this periodic calibration during unattended, automated runs.
  - f. Chemical analysis should be performed on a set of elements that are automatically detected as each spectrum is acquired. The system must include a classification system that has the capability to group definitions and allow for prioritization of the classifications. The system must allow the user to recalculate the chemistry classification of each particle after the analysis is complete.
  - g. The system must include templates for reports including operating parameters, detector calibration, sample layout, analysis summary, images acquired, and particle spectra. This must be customizable by the user.

3. Computer: The EDS system must include all computer hardware and software necessary to perform the above specifications.

III. Miscellaneous:

1. The new SEM/EDS system will replace an existing system, consisting of a CamScan Series 2 scanning electron microscope with a Tracor Northern TN 5500 EDX system. All offers must include the bidder's allowance for trade-in of the existing system, as well as dismantling and removal of the existing system.
2. The seller of all components must ensure full support for the entire system.
3. The system must include full installation and on-site training.
4. The system must include a full one-year warranty.
5. The system must include free software and firmware updates for the life of the instrument.
6. The system must be delivered and installed within 90 days of purchase.



# AFFIDAVIT

**West Virginia Code §5A-3-10a states:**

No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owned is an amount greater than one thousand dollars in the aggregate

**DEFINITIONS:**

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

**EXCEPTION:**

The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

**LICENSING:**

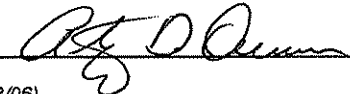
Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agencies or political subdivision. Furthermore, the vendor must provide all necessary releases to obtain information to enable the Director or spending unit to verify that the vendor is licensed and in good standing with the above entities.

**CONFIDENTIALITY:**

The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures and rules. Vendors should visit [www.state.wv.us/admin/purchase/privacy](http://www.state.wv.us/admin/purchase/privacy) for the Notice of Agency Confidentiality Policies.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), it is hereby certified that the vendor acknowledges the information in this said affidavit and are in compliance with the requirements as stated.

Vendor's Name: Tescan USA Inc.

Authorized Signature:  Date: 12-22-2006



Tescan USA Inc.  
 508 Thomson Park Drive  
 Cranberry Twp., PA 16066  
 Tel: 724-772-7433  
 Web: [www.tescan-usa.com](http://www.tescan-usa.com)  
 Email: [info@tescan-usa.com](mailto:info@tescan-usa.com)

**Technical Response to the State of West Virginia  
 RFQ DPS0716, Electron Microscopy Equipment**

Tescan USA Inc. is pleased to provide the enclosed proposal to the State of West Virginia in response to RFQ #DPS0716 for a Tescan Vega-II LSH Scanning Electron Microscope integrated with an Oxford Instruments Inca Energy Dispersive X-ray (EDX) and automated Gunshot Residue (GSR) analysis system. This is a fully integrated system, both physically and functionally, which meets or exceeds all technical specifications of the bid without exception. Detailed technical specifications for the system offered are enclosed with our proposal. In addition, a line-by-line technical response to the bid specifications is provided, starting on the following page. Tescan USA has over 20 years experience specializing in forensic SEM/EDX applications and has a long list of satisfied forensic customers, including for instance the West Virginia Department of Public Safety, the Federal Bureau of Investigation, the Los Angeles Police Department, the Alameda County Crime Laboratory, Allegheny County Crime Laboratory in Pittsburgh, Pennsylvania and many others. Many of these forensic labs are repeat customers who have purchased multiple or replacement instruments from us, attesting to the quality, reliability, and performance of our products and services. Enclosed with our proposal is a list of forensic references, all of which use the Vega-Oxford SEM/EDX/GSR system.

All questions regarding this proposal should be addressed to Mr. Tony Owens, 724-772-7433, [towens@tescan-usa.com](mailto:towens@tescan-usa.com).

**Summary of our Proposal:**

- Vega-II LSH Scanning Electron Microscope with a large 11-port, 230mm diameter specimen chamber
- Vega-II 5-axis compucentric stage, X=40mm, Y=40mm, Z=47mm, Tilt = -50° to +75°, Rotation=360°
- Vega-II Single-crystal YAG Everhart-Thornley Secondary Electron Detector
- Vega-II Single-crystal YAG Backscattered Electron Detector
- Vega-II fully integrated chamberscope (chamber TV camera) with infrared illumination
- Vega-II fully integrated picoammeter to monitor beam/specimen current
- Tescan MouseLink™ SEM/EDX keyboard/mouse sharing software
- Oxford Instruments INCA Energy 250 Energy Dispersive X-ray Microanalysis system
- Oxford INCAGSR – Dedicated, automated primer GSR detection and analysis (IEGSR)
- Complete System Delivery and Installation
- Comprehensive SEM/EDX/GSR System Training Including:
  - On-site SEM Operation and Maintenance Training, immediately following SEM installation
  - On-site EDX Training, immediately following EDX system installation
  - On-site Advanced GSR analysis applications training

<b>Total System Price .....</b>	<b>\$ 153,955.00</b>
<b>Allowance for trade-in of existing CamScan/Tracor Northern SEM/EDX ....</b>	<b>- \$ 20,000.00</b>
<b>Final System Price .....</b>	<b>\$ 133,955.00</b>

## Line-by-Line Response to the Bid Technical Specifications

**Explanation:** To facilitate easier reading of this response, each technical specification from RFQ DPS0716 is reproduced here in Times New Roman font. Our response is provided immediately thereafter in Arial font, clearly indicating whether the specification is met or exceeded and providing additional details and descriptions where required.

### **I. Scanning Electron Microscope (SEM)**

1. The microscope and all required components must operate from a standard 120V power source and require no compressed gas or water-cooling system.

**Specification Met.** The system offered operates from a standard 120V power source and requires no compressed gas or water-cooling whatsoever. The system is also very power efficient, requiring only about 850 watts of power during operation.

2. Accelerating Voltage: 200V to 30kV, in 10V increments

**Specification Met.** The microscope offered is capable of operating over an accelerating voltage range of 200V to 30kV, which can be adjusted in 10V increments over the entire operating range.

3. Resolution: 3.0nm (SE mode at 30kV)

**Specification Met.** The resolution of the microscope is 3.0nm in SE mode at 30kV.

4. Magnification: 4x to 500,000x

**Specification Exceeded.** The magnification range of the Vega-II LSH SEM offered is 4x to 500,000x. In addition, the Vega-II SEM's unique 4-lens Wide Field Optics™ column provides a Fish-eye imaging mode that allows "macro" images of the sample at magnifications < 4x.

5. Electron Optics: The column shall be fully computer-controlled (no mechanical centering controls) with automatic filament saturation, emission current adjustment, gun alignment, electronic aperture alignment, brightness, contrast, focus, and stigmatism. Automatic setting of optimum beam diameter as a function of magnification.

**Specification Met.** The Vega-II LSH SEM includes an innovative 4-lens electron optical system with no mechanical centering controls; electron optics control is fully automated and fully computer controlled, with automatic filament saturation, emission current adjustment, two-stage gun alignment (tilt and shift alignments), electronic aperture alignment, brightness, contrast, focus, and stigmatism. The SEM user can manually specify the beam diameter (spot size) or the SEM software can automatically set the optimum beam diameter as a function of magnification.

6. Sample Chamber: The chamber must have multiple (11) ports for simultaneous mounting of various detectors including SE, BSE, EDX, chamber camera, and picoammeter.

**Specification Met.** The Vega-II LSH SEM is fitted with a research-grade, multi-ported sample chamber with 11 interface ports and optimized port geometries, allowing the simultaneous integration and use of various detectors including (but not limited to) SE, BSE, EDX, chamber camera, picoammeter, TE, WDX, and EBSD.

7. Sample Stage: The sample stage must be capable of 5 axes of movement (x, y, z, tilt, and rotation). The stage must be motorized and computer controlled in x, y, z, and rotation and capable of unattended, automated GSR analysis of at least nine standard stubs (~ 1/2" diameter) or three larger stubs (~ 3/4" diameter). The stage must be equipped with a touch alarm. It must be designed so that samples may be exchanged without contact with the interior of the chamber.

**Specification Met.** The Vega-II LSH SEM is fitted with a 5-axis compucentric specimen stage with the following motions: X=40mm, Y=40mm, Z=47mm, Rotation=360° continuous, Tilt= -50° to +90°. The X, Y, Z, and Rotation motions are motorized and fully computer controlled, allowing unattended and automated GSR analysis of nine standard ( 1/2 ") or three large ( 3/4 ") stubs. The stage control system includes a touching alarm, which sounds an audible alarm and also automatically interlocks all motorized stage motion when activated. The LSH stage is a drawer design, which pulls out to fully expose the stage, allowing sample exchange without any contact with the interior of the chamber.

8. Detectors: Secondary (SE) and Backscatter electron (BSE) detectors, fitted with permanent single crystal YAG scintillators. Must have a picoammeter and infrared chamberscope, both interfaced with the SEM. Should include signal inputs for at least four detectors.

**Specification Exceeded.** The Vega-II LSH SEM includes secondary electron (SE) and backscatter electron (BSE) detectors, both fitted with ITO-coated, single-crystal YAG scintillators. The microscope also includes a picoammeter and infrared chamberscope, both fully integrated into SEM graphical user interface (not add-on devices). All second generation Vega-II SEMs now include signal inputs for up to eight (8) detectors.

9. Vacuum System: Must include turbomolecular and rotary pump, both with gauges capable of monitoring and displaying high vacuum levels in user selectable pressure units.

**Specification Exceeded.** The Vega-II LSH SEM offered is fitted with a fully computer controlled compound (two-stage) turbomolecular-turbodrag pump with wear- and vibration-free magnetically levitated high vacuum bearings. The backing and roughing pump is a two-stage rotary vane pump. Full vacuum gauging integrated into the SEM graphical user interface allows the user to monitor vacuum levels in both analog and digital formats, and in user selectable pressure units.

10. Computer System: The system must be fully computer controlled using the Windows XP Professional system and include this system. Minimum PC requirements include Intel Pentium 4, 3.0 GHz HT, 512 MB RAM, 80G hard drive, CD-RW/DVD-R drive, two Ethernet interface cards, 19" digital LCD display, and the Windows XP Professional System. The system must be upgradeable without requiring a service call.

**Specification Exceeded.** The system provided is fully computer software controlled in the Windows XP Professional operating system environment. The system will also be Windows Vista capable, ensuring an operating system upgrade path for the future. The minimum PC specifications shall be Intel Pentium 4, 3.0GHz HT processor, 512MB DDR-RAM, 80GB hard drive, CD-RW/DVD-R combo drive, two Ethernet network interface cards, dual matching 19" digital LCD displays (one for SEM, one for EDX), and the Windows XP Professional™ operating system. The computer workstation contains no special or proprietary SEM hardware whatsoever and connects to the microscope solely via a standard Ethernet cable; this architecture allows the user to easily upgrade the computer in the future without requiring a service call.

11. Image Display: The system must be able to display, capture, and archive images up to 8192 x 8192 pixels, using square pixels. It should be able to store and retrieve images in common formats (TIFF, JPEG, BMP) and be capable of storing all operating conditions as well as notes and text. The system must include an integrated image database that allows for archiving, sharing, searching, and printing of images.

**Specification Exceeded.** The Vega-II LSH SEMs supports the acquisition of digital images in user selectable sizes from 512 pixels up to 8192 pixels. Users can select square images (1:1 aspect ratio) or rectangular images (3:4 aspect ratio). In addition, the software automatically selects a 2:1 image aspect ratio when the user selects the split screen display mode so that each side of the split screen is a square image. Regardless of aspect ratio, pixels are always square. Images can be saved in a wide range of industry standard formats including TIFF, JPEG, JPEG2000, BMP, PNG, GIF, PGM, and PPM. Both 8-bit and true 16-bit pixel depths are supported as well as 24-bit true color images. The system includes an integrated image manager database allowing the user to archive, share, and search for images, as well as an XML-template based image report and print generator.

12. Remote Operation: The system must be capable of off-site monitoring, control, and operation as well as creating a log of operating data/error information that can be emailed for technical support.

**Specification Met.** The Vega-II SEMs include a fully integrated, built-in secure SEM Server developed entirely by Tescan (not 3<sup>rd</sup> party software), allowing the microscope to be remotely accessed, controlled, and diagnosed via any TCP/IP connection (e.g. over a LAN or Internet connection). The server can be quickly and easily disabled to prevent access to the SEM, and access can be limited to image viewing only or full SEM control. The Vega-II SEMs also incorporate comprehensive system logging, which records in monthly log files all SEM access and use, all hardware and software diagnostics results, and all software processes running on the SEM PC (so as to monitor new software installations and possible software conflicts).

13. System Diagnostics and Backups: The system must be capable of performing self-tests on both hardware and software systems. It must be able to log these tests in a format that can be emailed for technical support. The system must also include the capability to automatically backup all system and configuration files.

**Specification Met.** All Vega-II SEMs incorporate an integrated I2C back-channel bus to allow comprehensive internal diagnostics encompassing all SEM subsystems. A full internal hardware and software diagnostic self-test procedure is executed at each user logon; all faults, errors, and unusual conditions or user settings are reported and logged, and corrective actions suggested. All test results are permanently appended to monthly log files. The Vega-II GUI software also includes single-click menu selections for automatically packing the SEM's entire log history, as well as all SEM configuration files, into a single archive file for emailing to the Tescan service organization for technical support. Lastly, the Vega-II SEM software automatically backs up all SEM system and configuration files to a user specified location every time the Vega software is started.

14. User Accounts: The system must be capable of multiple user accounts that can allow each user to save configuration files and working conditions that can be easily recalled. These accounts should be password protected.

**Specification Exceeded.** All SEM access is through independent password-protected user accounts. All user accounts are managed by a single supervisor account with administrative privileges. The supervisor can assign different levels of expertise to each user account depending on the user's experience and the level of privileges to be granted. Each user has a default configuration and can also store an unlimited number of additional configuration files that store and recall all microscope settings as well as the user's preferences.

15. Filament: The system must include a box of replacement filaments.

**Specification Met.** The Vega-II SEM offered includes spare filaments.

## II. Energy Dispersive X-ray Analysis System (EDS):

1. Detector: The EDX system must include a detector that has a resolution of at least 137eV at Mn Ka and must be capable of detecting Boron. It must have a digital pulse processor with at least six processing time constants and a maximum throughput of 50,000 counts per second. The system must be capable of in-site detector crystal re-conditioning and de-icing.

**Specification Met.**

2. Software:

a. The system must include automatic peak identification for qualitative analysis and standardless quantitative analysis. It must be capable of collecting full spectrum X-ray maps and perform analysis from reconstructed spectra.

**Specification Met.**

b. The system must be capable of controlling the SEM column and stage through a single TCP/IP interface.

**Specification Met.**

c. The system must include software for automated, unattended analysis of multiple GSR samples that can be recalled by the operator.

**Specification Met.**

d. The system must allow the user to relocate, re-images, and reanalyze any particle detected during automated analysis to allow form confirmation of both morphology and composition. A schematic of the stage must be included that shows the user defined samples in an adjustable perspective.

**Specification Met.**

e. The system must be capable of periodically collecting video and X-ray data for the purpose of showing stability or detecting any changes in electron beam or performance of the EDS system over the course of analyzing a sample. A standard sample must be supplied that slows for this periodic calibration during unattended, automated runs.

**Specification Met.**

f. Chemical analysis should be performed on a set of elements that are automatically detected as each spectrum is acquired. The system must include a classification system that has the capability to group definitions and allow for prioritization of the classifications. The system must allow the user to recalculate the chemistry classification of each particle after the analysis is complete.

**Specification Met.**

g. The system must include templates for reports including operating parameters, detector calibration, sample layout, analysis summary, images acquired, and particle spectra. This must be customizable by the user.

**Specification Met.**

3. Computer: The EDS system must include all computer hardware and software necessary to perform the above specifications.

**Specification Met.**

### III. Miscellaneous:

1. The new SEM/EDS system will replace an existing system, consisting of a CamScan Series 2 scanning electron microscope with a Tracor Northern TN5500 EDX system. All offers must include the bidder's allowance for trade-in of the existing system, as well as dismantling and removal of the existing system.

**Specification Met.** Our offer includes a \$20,000 allowance for trade-in of the existing CamScan Series 2 scanning electron microscope with a Tracor Northern TN5500 EDX system. Tescan USA will take full responsibility for the dismantling, packing, and removal of the existing system.

2. The seller of all components must ensure full support for the entire system.

**Specification Met.** Tescan USA shall ensure full support for the entire system.

3. The system must include full installation and on-site training.

**Specification Met.** Our proposal includes full system installation, proof of performance, and comprehensive on-site training for SEM, EDX, and GSR system operation.

4. The system must include a full one-year warranty.

**Specification Met.** The entire system offered includes a full one-year warranty covering all parts, labor, and travel expenses.

5. The system must include free software and firmware updates for the life of the instrument.

**Specification Met.** All Tescan microscopes include free software and firmware updates for the life of the instrument. Software updates are simple to perform, require only a few minutes, and can be accomplished by lab personnel without requiring a service call. Firmware updates are automatically and transparently performed during software updates.

6. The system must be delivered and installed within 90 days of purchase.

**Specification Met.** The system shall be delivered and installed within 90 days of purchase.