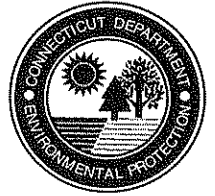


# STATE OF CONNECTICUT

## DEPARTMENT OF ENVIRONMENTAL PROTECTION



STATE OF CONNECTICUT

V.

DERINGER-NEY, INC.

CONSENT ORDER # WSWDH 10010

Date Issued: July 8, 2010

- A. With the agreement of Deringer-Ney, Inc. ("Respondent"), the Commissioner of Environmental Protection ("the Commissioner") finds:
1. Respondent is an Illinois corporation, which is or has engaged in the business of manufacturing electrical contacts and inserts, and is located at 2 Douglas Street, Bloomfield, Connecticut ("the site").
  2. The Respondent is or has been a generator of hazardous waste at the site.
  3. An inspection conducted by the Department of Environmental Protection, Bureau of Materials Management and Compliance Assurance, Waste Engineering and Enforcement Division, on December 11 & 14, 2009 indicates that the Respondent failed to comply with the following:
    - a. Perform a hazardous waste determination on each waste stream generated at the site, in violation of the Regulations of Connecticut State Agencies ("RCSA") Section 22a-449(c)-102(a)(2)(A), incorporating (with specified changes) Title 40 of the Code of Federal Regulations ("CFR") 262.11. Specifically, the Department found that the documentation necessary to support a hazardous waste determination was not available for: 1) spent phosphoric acid-based solution generated by an ultrasonic parts - cleaner operated in the rod and wire department; and 2) spent mercury containing lamps generated throughout the facility.
    - b. Submit a Biennial Report, in violation of RCSA Section 22a-449(c)-102(a)(2)(AA), which incorporates (with specified changes) 40 CFR 262.41. Specifically, the Department found that a Biennial Report, covering hazardous waste generator activities during calendar year 2007, has not been submitted to the Department to date.
    - c. Separate ignitable waste from all sources of ignition or reaction, in violation of RCSA Section 22a-449(c)-102(a)(2)(K), incorporating 40 CFR 265.17(a). Specifically, the Department found that containers of ignitable waste liquid were co-stored with containers of acidic waste liquid without a means to separate these potentially incompatible materials (i.e., containment berm).

- d. Post "No Smoking" signs in areas where ignitable waste is handled, in violation of RCSA Section 22a-449(c)-102(a)(2)(K), incorporating 40 CFR 265.17(a). Specifically, the Department found that a "No Smoking" sign was not posted in the storage room where containers of ignitable waste were being accumulated. *Note:* The Department is aware that a "No Smoking" sign was subsequently posted in the area previously described.
- e. Keep containers managed in a satellite accumulation area closed, in violation of RCSA Section 22a-449(c)-102(a)(2)(M), which incorporates (with specified changes) 40 CFR 262.34(c)(1)(i). Specifically, the Department found that a 55-gallon drum of waste oil/alcohol mixture located near the chip spinners was open (drum-top funnel protruding through an open bung).
- f. Mark containers managed in a satellite accumulation area with the words "Hazardous Waste" and with other words that identify the contents of each container, in violation of RCSA Section 22a-449(c)-102(a)(2)(N), which incorporates (with specified changes) 40 CFR 262.34(c)(1)(ii). Specifically, the Department found that: 1) a 55-gallon drum of waste oil/alcohol mixture located near the chip spinners was not marked "Hazardous Waste" or with other words that identify the contents of the container; 2) a one-gallon jug of waste alcohol and acetone, located in the R&D Lab was not marked "Hazardous Waste" (instead it was marked "waste") or with other words that identify the contents of the container; and 3) a 5-gallon jug of waste nitric acid and hydrochloric acid located in the R&D Lab was not marked "Hazardous Waste" or with other words that identify the contents of the container.
- g. Provide the base of a container storage area with a surface that is sufficiently impervious, in violation of RCSA Section 22a-449(c)-102(a)(2)(E), which incorporates (with specified changes) 40 CFR 264.175(b)(1). Specifically, the Department found that the base of the container storage area had not been adequately sealed to ensure hazardous constituents do not migrate into or through such base should there be a leak and/or a spill of hazardous waste in the storage area.
- h. Provide the container storage area with secondary containment, in violation of RCSA Section 22a-449(c)-102(a)(2)(E), incorporating 40 CFR 264.175(b)(3). Specifically, the Department found that the container storage area had not been provided with a containment system having a capacity to contain 10% of the volume of containers or the volume of the largest container managed in the storage area, whichever is greater.
- i. Mark each container with the date upon which each period of hazardous waste accumulation began, in violation of RCSA Section 22a-449(c)-102(a)(1), incorporating 40 CFR 262.34(a)(2). Specifically, the Department found that seven out of eight containers accumulating hazardous waste on-site were not marked with the date waste began accumulating in such containers.

- j. Comply with the storage facility requirements (for hazardous waste stored greater than 90 days), in violation of RCSA Section 22a-449(c)-104, which incorporates (with specified changes) 40 CFR 264, the permit requirements of RCSA Section 22a-449(c)-110, incorporating (with specified changes) 40 CFR 270 and the specified sections of 40 CFR 124 (as revised). Specifically, the Department found that at least one drum of waste nitric/hydrochloric acid (dated April 13, 2009) had been stored for greater 90 days at the time of the inspection. *Note:* Additional containers of hazardous waste being managed on-site at the time of the inspection may have been stored greater than 90 days, however, this could not be confirmed since the containers were not marked with the date waste accumulation began.
- k. Mark used oil storage units with the words "Used Oil", in violation of RCSA Section 22a-449(c)-119(a)(1), incorporating 40 CFR 279.22(c)(1). Specifically, the Department found that a 275-gallon tank and a 350-gallon tote used to store used oil were not marked with the words "Used Oil". *Note:* Prior to completion of the inspection, both used oil storage units were marked with the words "Used Oil".
- l. Perform inspections of all hazardous waste storage areas operated at the facility, in violation of RCSA Section 22a-449(c)-102(b)(2), incorporating 40 CFR 265.15. Specifically, the Department found that inspection of the container storage area, the loading and unloading area(s), and safety and emergency response equipment had not been performed since at least July of 2009.
- m. Develop and follow a written inspection schedule, in violation of RCSA Section 22a-449(c)-102(b)(2), incorporating 40 CFR 265.15. Specifically, the Department found that a schedule had not been developed for inspections of the container storage area, the loading and unloading area(s), and safety and emergency response equipment.
- n. Make amendments to the contingency plan when necessary, in violation of RCSA Section 22a-449(c)-102(a)(2)(K), which incorporates (with specified changes) 40 CFR 262.34(a)(4). Specifically, the Department found that the contingency plan in place at the time of the inspection did not include: 1) current emergency procedures; 2) current emergency coordinator information; 3) current emergency equipment information; 4) an evacuation plan (*Note:* The Department recognizes that an evacuation plan has been developed, but it was not incorporated into the contingency plan at the time of inspection); and 5) arrangements agreed to by local emergency personnel, as well as emergency response contractors, that may be called upon to provide emergency services.
- o. Submit the contingency plan to all potential emergency responders, in violation of RCSA Section 22a-449(c)-102(a)(2)(K), which incorporates (with specified changes) 40 CFR 262.34(a)(4). Specifically, the Department found no documentation indicating that the contingency plan had been submitted to all local emergency services and/or emergency response contractors that may be called upon to provide emergency services.
- p. Provide facility personnel with the required training, in violation of RCSA Section 22a-449(c)-102(a)(2)(K), which incorporates (with specified changes) 40 CFR 262.34(a)(4). Specifically, the Department found that the training provided to facility personnel was outdated and/or inadequate.

- q. Failed to maintain the required training documentation, in violation of RCSA Section 22a-449(c)-102(a)(2)(K), which incorporates (with specified changes) 40 CFR 262.34(a)(4). Specifically, the Department found that the following documents were not available at the facility at the time of the inspection: 1) job titles for each position at the facility related to hazardous waste management, and the name(s) of the employee filling each job; 2) written job descriptions for each position; 3) written description of the type and amount of both introductory and continuing training given (or to be given) to each employee; and 4) records documenting that the training or job experience required has been completed.
  - r. Failed to manage universal waste lamps in a way that prevents releases of any universal waste lamp or component of a universal waste lamp to the environment, in violation of RCSA Section 22a-449(c)-113(a)(2)(G), which incorporates (with specified changes) 40 CFR 273.13(d). Specifically, the Department found that universal waste lamps were being disposed of in an on-site solid waste dumpster prior to the inspection at a rate of approximately 60 lamps every 1-2 months.
- 4. On February 26, 2010, the DEP issued Notice of Violation No. WSWDHI0016 to the Respondent to correct violations corresponding to those cited in subparagraph A.3.a. through A.3.r. of this consent order.
  - 5. Based on correspondence submitted to the DEP on March 31, 2010 Respondent has corrected the violations corresponding to those listed in subparagraphs A.3.a. through A.3.r. of this consent order.
  - 6. By virtue of the above, the Respondent has violated RCSA Section 22a-449(c)-100, et seq.
  - 7. By agreeing to the issuance of this consent order, Respondent makes no admission of fact or law with respect to the matters addressed herein, other than the facts asserted in paragraphs A.1., A.2., A.4., and A.5. inclusive.
- B. With the agreement of Respondent, the Commissioner, acting under Sections 22a-6, 22a-131, and 22a-449 of the Connecticut General Statutes, orders Respondent as follows:
- 1. Compliance Assurance. Respondent shall maintain its compliance with all applicable provisions of the Regulations of Connecticut State Agencies Sections 22a-449(c)-100, et. seq., including but not limited to those regulations applicable to generators of hazardous waste identified in paragraph A.3. above. In particular:
    - a. Respondent has identified Dennis Waslenchuk of ENVIRON International Corp. as the qualified consultant, who is acceptable to the Commissioner. Respondent or the identified consultant shall prepare the documents and the consultant shall implement or oversee the actions required by this consent order. Respondent shall retain DennisWaslenchuk of ENVIRON International Corp. or another qualified environmental consultant acceptable to the Commissioner until this consent order is fully complied with. Within **ten (10)** days after retaining any consultant other than the one originally identified under this paragraph, or retaining an independent environmental consultant for the purposes of compliance with this paragraph, Respondent shall notify the Commissioner in writing of the identity of such other consultant. Respondent shall submit to the

Commissioner a description of the consultant's education, experience and training which is relevant to the work required by this consent order within ten (10) days after a request for such a description. Nothing in this paragraph shall preclude the Commissioner from finding a previously acceptable consultant unacceptable.

- b. On or before **sixty (60)** days after issuance of this consent order, Respondent shall submit for the Commissioner's review and written approval, a plan detailing additional actions and/or operational changes it has undertaken or will undertake to ensure compliance with the Connecticut's hazardous waste management regulations RCSA Sections 22a-449(c)-100, et. seq., including, but not limited to, those set forth in paragraph A.3. of this consent order.
  - c. On June 9, 2010 the Respondent submitted, for the Commissioner's review and written approval, a Business Recycling Profile documenting the Respondent's management of recyclable materials. Refer to the enclosed "Business Recycling Profile" (Attachment A).
  - d. On or before **ninety (90)** days after issuance of this consent order, Respondent shall submit for the Commissioner's review and written approval, a plan detailing actions it has undertaken or will undertake to perform closure of the area(s) used for the disposal of spent mercury containing lamps at the site in a manner that: (i) Minimizes the need for further maintenance; and (ii) Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous waste constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to atmosphere. The plan shall be consistent with the document entitled "Draft RCRA Closure Guidance For Generators Who Store Less Than 90 Days, Container Storage and Tank Systems". Within five (5) days after the Commissioner approves such plan, Respondent shall carry out the plan.
2. Status of Notice of Violation (NOV) No. WSWDH10016. This consent order supersedes NOV No. WSWDH10016.
  3. Full compliance. Respondent shall not be considered in full compliance with this consent order until all actions required by this consent order have been completed as approved and to the Commissioner's satisfaction.
  4. Civil penalty. On or before **thirty (30)** days after issuance of this consent order, Respondent shall pay a penalty of twenty-three thousand one hundred sixty-five dollars (**\$23,165<sup>00</sup>**) as the total civil penalty to be sought by the Commissioner for those, and only those, violations described in paragraph A.3. of this consent order.
  5. Supplemental Environmental Project. In addition to the civil penalty referenced in paragraph B.4., Respondent has agreed to undertake the following supplemental environmental project ("SEP") requiring an expenditure of at least twenty-three thousand two hundred dollars (**\$23,200**), which is the total estimated cost as determined by the Commissioner for the SEP required under this paragraph, or make payment(s) as follows:
    - a. Respondent shall perform the SEP identified and described in Attachment B to this consent order. Respondent shall perform such SEP in accordance with the schedule

approved by the Commissioner, and shall obtain any federal, state or local permit or approval necessary to carry out such SEP.

- b. If Respondent fails to fully perform any SEP in accordance with subparagraph B.5.a., Respondent shall immediately notify the Commissioner in writing of such noncompliance and shall, upon written request by the Commissioner, remit a payment equal to the total estimated cost, as determined by the Commissioner of all such SEP(s), plus **\$2,320 (for a total of \$25,520)**. Within **fourteen (14)** days after the date of the Commissioner's written request, Respondent shall make such payment in accordance with the remittance procedures for unexpended SEP funds in paragraph B.6. ("Payment of penalties.") of this consent order.
  - c. On or before **thirty (30)** days after completion of the SEP, Respondent shall submit for the Commissioner's review and written approval a comprehensive final report that certifies completion of such SEP. Such final report shall include, at a minimum, a narrative history of the project, detailed explanation of its design and implementation, summary of any data collected, complete final accounting of actual project costs including receipts for out-of-pocket costs, and a discussion of environmental benefits resulting from the SEP.
  - d. Should the Commissioner determine that the actual cost to the Respondent of any fully completed SEP is less than the estimated cost, as determined by the Commissioner, of such SEP, Respondent shall pay the difference between such actual cost and the estimated cost to the Commissioner as unexpended SEP funds. The Commissioner shall notify the Respondent in writing of the amount of any such unexpended SEP funds that are due. Respondent shall, within **fourteen (14)** days after the date of such written notice, remit the full amount of the unexpended SEP funds. Payment of unexpended SEP funds shall be made in accordance with the instructions detailed in paragraph B.6. ("Payment of penalties.") below.
  - e. If and when Respondent disseminates any publicity, including but not limited to any press releases regarding funding a SEP, Respondent shall include a statement that such funding is in partial settlement of an enforcement action brought by the Commissioner.
  - f. Respondent shall not claim or represent that any SEP payment made pursuant to this consent order constitutes an ordinary business expense or charitable contribution or any other type of tax deductible expense, and Respondent shall not seek or obtain any other tax benefit such as a tax credit as a result of the payment under this paragraph.
6. Payment of penalties. Payment of penalties under this consent order shall be mailed or personally delivered to the Department of Environmental Protection, Bureau of Financial and Support Services, Accounts Receivable Office, 79 Elm Street, Hartford, CT 06106-5127, and shall be by certified or bank check payable to "Treasurer, State of Connecticut". The check shall state on its face, "Bureau of Materials Management and Compliance Assurance, Waste Engineering and Enforcement Division civil penalty, Consent Order No. WSWDH 10010 \_\_\_\_\_." A copy of the check and any transmittal letter shall also be sent to Ms. Julie Dutton in the Bureau of Materials Management and Compliance Assurance at the same address.

7. Sampling and sample analyses. All sampling and sample analyses which, are required by this consent order and all reporting of such sample analyses shall be conducted by a laboratory certified by the Connecticut Department of Public Health Services to conduct such sampling and analyses. All sampling and sample analyses performed under this order shall be performed in accordance with procedures specified or approved in writing by the Commissioner, or, if no such procedures have been specified or approved, in accordance with EPA document SW-846. Unless otherwise specified by the Commissioner in writing, the value of each parameter shall be reported to the maximum level of precision and accuracy specified in the applicable protocol, and if no such level is specified, to the maximum level of precision and accuracy possible.
8. Approvals. Respondent shall use best efforts to submit to the Commissioner all documents required by this consent order in a complete and approvable form. If the Commissioner notifies Respondent that any document or other action is deficient, and does not approve it with conditions or modifications, it is deemed disapproved, and Respondent shall correct the deficiencies and resubmit it within the time specified by the Commissioner or, if no time is specified by the Commissioner, within thirty (30) days of the Commissioner's notice of deficiencies. In approving any document or other action under this consent order, the Commissioner may approve the document or other action as submitted or performed or with such conditions or modifications as the Commissioner deems necessary to carry out the purposes of this consent order. Nothing in this paragraph shall excuse noncompliance or delay.
9. Definitions. As used in this consent order, "Commissioner" means the Commissioner or a representative of the Commissioner.
10. Dates. The date of "issuance" of this consent order is the date the consent order is deposited in the U.S. mail or personally delivered, whichever is earlier. The date of submission to the Commissioner of any document required by this consent order shall be the date such document is received by the Commissioner. The date of any notice by the Commissioner under this consent order, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is deposited in the U.S. mail or is personally delivered, whichever is earlier. Except as otherwise specified in this consent order, the word "day" as used in this consent order means calendar day. Any document or action which is required by this consent order to be submitted or performed by a date which falls on a Saturday, Sunday or a Connecticut or federal holiday shall be submitted or performed by the next day which is not a Saturday, Sunday or Connecticut or federal holiday.
11. Certification of documents. Any document, including but not limited to any notice, which is required to be submitted to the Commissioner under this consent order shall be signed by Respondent or, if Respondent is not an individual, by Respondent's chief executive officer or a duly authorized representative of such officer, as those terms are defined in §22a-430-3(b)(2) of the Regulations of Connecticut State Agencies, and by the individual(s) responsible for actually preparing such document, and Respondent or Respondent's chief executive officer and each such individual shall certify in writing as follows:

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, that the submitted information is

true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under §53a-157b of the Connecticut General Statutes and any other applicable law."

12. Noncompliance. This consent order is a final order of the Commissioner with respect to the matters addressed herein, and with the exception of the approval or disapproval of the closure plan submitted under paragraph B.1.d., is nonappealable and immediately enforceable. Failure to comply with this consent order may subject Respondent to an injunction and penalties.
13. False statements. Any false statement in any information submitted pursuant to this consent order may be punishable as a criminal offense under §53a-157b of the Connecticut General Statutes and any other applicable law.
14. Notice of transfer; liability of Respondent. Until Respondent has fully complied with this consent order, Respondent shall notify the Commissioner in writing no later than fifteen (15) days after transferring all or any portion of the facility, the operations, the site or the business which is the subject of this consent order or after obtaining a new mailing or location address. Respondent's obligations under this consent order shall not be affected by the passage of title to any property to any other person or municipality.
15. Commissioner's powers. Except as provided herein above with respect to payment of civil penalties pursuant to this consent order, nothing in this consent order shall affect the Commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for past, present, or future violations of law not otherwise addressed by this consent order. If at any time the Commissioner determines that the actions taken by Respondent pursuant to this consent order have not successfully corrected all violations, fully characterized the extent or degree of any pollution, or successfully abated or prevented pollution, the Commissioner may institute any proceeding to require Respondent to undertake further investigation or further action to prevent or abate violations or pollution.
16. Respondent's obligations under law. Nothing in this consent order shall relieve Respondent of other obligations under applicable federal, state and local law.
17. No assurance by Commissioner. No provision of this consent order and no action or inaction by the Commissioner shall be construed to constitute an assurance by the Commissioner that the actions taken by Respondent pursuant to this consent order will result in compliance or prevent or abate pollution.
18. Access to site. Any representative of the Department of Environmental Protection may enter the site without prior notice for the purposes of monitoring and enforcing the actions required or allowed by this consent order.
19. No effect on rights of other persons. This consent order neither creates nor affects any rights of persons or municipalities that are not parties to this consent order.




20. Notice to Commissioner of changes. Within fifteen (15) days of the date Respondent becomes aware of a change in any information submitted to the Commissioner under this consent order, or that any such information was inaccurate or misleading or that any relevant information was omitted, Respondent shall submit the correct or omitted information to the Commissioner.
21. Notification of noncompliance. In the event that Respondent becomes aware that it did not or may not comply, or did not or may not comply on time, with any requirement of this consent order or of any document required hereunder, Respondent shall immediately notify by telephone the individual identified in the next paragraph and shall take all reasonable steps to ensure that any noncompliance or delay is avoided or, if unavoidable, is minimized to the greatest extent possible. Within five (5) days of the initial notice, Respondent shall submit in writing the date, time, and duration of the noncompliance and the reasons for the noncompliance or delay and propose, for the review and written approval of the Commissioner, dates by which compliance will be achieved, and Respondent shall comply with any dates which may be approved in writing by the Commissioner. Notification by Respondent shall not excuse noncompliance or delay, and the Commissioner's approval of any compliance dates proposed shall not excuse noncompliance or delay unless specifically so stated by the Commissioner in writing.
22. Submission of documents. Any document required to be submitted to the Commissioner under this consent order shall, unless otherwise specified in this consent order or in writing by the Commissioner, be directed to:


Mr. Paul Franson, Environmental Analyst 3  
Bureau of Materials Management and Compliance Assurance  
Waste Engineering and Enforcement Division  
Department of Environmental Protection  
79 Elm Street  
Hartford, Connecticut 06106-5127

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Respondent consents to the issuance of this consent order without further notice. The undersigned certifies that he/she is fully authorized to enter into this consent order and to legally bind the Respondent to the terms and conditions of the consent order.

BY:  **DERINGER-NEY, INC.**  
NAME: John L. Wallace ON BEHALF OF DERINGER NEY INC  
TITLE: President  
DATE: June 18, 2010

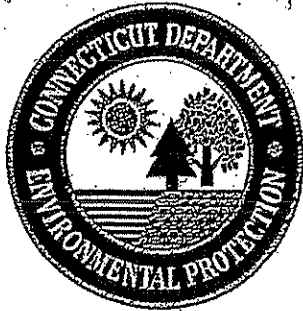
Issued as a final order of the Commissioner of Environmental Protection.

 July 7, 2010  
Amy W. Marrella Date  
Commissioner

Consent Order No. : 10010

**ATTACHMENT A**

Business Recycling Profile Form



### All Businesses Are Required to Recycle:

**High Grade White Office Paper (HGWOP)** White copy paper, computer paper, office stationery, memo paper, etc.

**Old Corrugated Cardboard (OCC)** Old or discarded corrugated boxes - *Not waxed*

**Old Newspaper (ONP)** Used or discarded newspapers

**Glass & Metal Food and Beverage Containers** (including 5¢ deposit containers)

**Leaves Foliage** which has fallen from trees must be recycled

**Used Crankcase Oil** Used crankcase oil from internal combustion engines

**Lead Acid Storage Batteries** Used batteries from cars, airplanes, boats, tractors, etc.

**Scrap Metal** Used or discarded items which consist predominantly of metals such as iron, aluminum, brass, copper, lead, chromium, tin, nickel, etc. or alloys of these metals, including but not limited to appliances.

**Rechargeable Batteries** Nickel-cadmium (NiCd) rechargeable batteries, both those contained within appliances and those sold individually are required to be recycled after they no longer are usable.

**Grass Clippings** Best practice is to recycle grass by leaving grass clippings on the lawn.

In addition to the state mandated recyclables listed above, check your local ordinances to learn about additional materials your business may be required to recycle including plastic bottles.

**58% by 2024**

## ATTACHMENT A Business Recycling Profile

CT DEP, Bureau of Materials Management & Compliance Assurance

In Connecticut recycling is mandatory. Connecticut General Statutes and the Regulations of Connecticut State Agencies require designated items to be recycled by everyone. Every resident, business, government facility, school, college, hospital, institution, etc. is required by law to recycle glass & metal food and beverage containers, corrugated cardboard, newspaper, white office paper (except from a residential property), scrap metal, Ni-Cd rechargeable batteries, used crankcase oil, lead acid batteries, leaves and grass clippings.

Recycling these items is a critical action we can all take to move the State towards achieving our recycling rate of 58% by 2024 as stated in the amended December 2006 CT State Solid Waste Management Plan. Complying with the state recycling laws has tremendous environmental benefits such as conserving natural resources, reducing pollutants emitted to our air and water, conserving energy, reducing greenhouse gas emissions, and eliminating the need for new solid waste disposal facilities.

This form is a guidance document to help businesses better manage their recycling program and increase recovery efforts. This form does not need to be submitted to DEP unless it is requested, in response to an inspection and/or an enforcement action. For more recycling resources please visit our Business Recycling Resources webpage.

### Company Information

Company Name: DERINGER-NEY INC

Address: 2 DOUGLAS ST  
BLOOMFIELD, CT 06002

Recycling Contact: MARK ELLIOTT

Title: FACILITY MANAGER

Phone(s): 860 242 2281

Email: MELLIOTT@DERINGER-NEY.COM

Additional Contact: \_\_\_\_\_

Title: \_\_\_\_\_

Phone(s): \_\_\_\_\_

Email: \_\_\_\_\_

### Facility/Operations

Type of business: MANUFACTURER OF HIGH PERFORMANCE ALLOYS, PRECISION METAL COMPONENTS, PRECISION INSERT MOLDING & PART ASSEMBLIES

Number of buildings, total square footage of building(s): \_\_\_\_\_

1 BUILDING, 100,000 SQ FT

Acreage of lawn area: 4

Number of employees: 135

Current solid waste/recycling hauler(s) (Name/Phone): \_\_\_\_\_

USA HAULING & RECYCLING 860 746-3200

Building Owner: MOSCOW CABLE CO

Mailing Address: 5 WATERSIDE CROSSING, WINDSOR, CT USA

Phone: 860 654 0606

Email: \_\_\_\_\_

**Company's Current Recycling & Recovery Efforts**

Please use the table below to describe your Company's current recycling program. Attachments of photos or other documents also accepted.

RECYCLABLE MATERIAL	AVG WEIGHT (Indicate tons or pounds) COLLECTED FOR RECYCLING EACH MONTH (If you don't have weight data enter the number and size of containers and collection frequency)	HOW & WHERE MATERIAL IS COLLECTED	WHO PICKS-UP MATERIAL AND WHERE IS THE MATERIAL TAKEN FOR RECYCLING
EXAMPLE: OFFICE PAPER (white and other paper combined)	One 40-gallon wheeled cart/week	Everyone collects at their desks; brought to central location. (large wheeled cart near elevators). Janitor brings to loading dock when it is full (about once a week)	Our current trash hauler, (XYZ Trash Hauling, Windsor, CT) empties our paper recycling wheeled cart 2x/month (we call them as-needed) and material is taken to the ABC recycling facility in (Name of Town).
Office paper (white paper)**	WE ARE DOING SINGLE STREAM RECYCLING AND HAVE A SINGLE 10 YARD DUMPSTER THAT GETS PICKED UP ONCE PER MONTH. SEE ATTACHED LIST OF ACCEPTABLE ITEMS.	EVERYONE SEPARATES THEIR OWN WASTE EITHER AT THEIR DESK OR WORK AREA. WE HAVE PROVIDED A GARBAGE AND A RECYCLE CONTAINER AT EACH LOCATION. THE JANITOR COLLECTS EACH WASTE ONCE PER DAY AND PLACES THEM IN THE CORRECT DUMPSTER.	USA HAULING & RECYCLING, EAST WINDSOR, CT EMPTIES THE 10 YARD SINGLE STREAM DUMPSTER ONCE PER MONTH.
Newspaper**	SINGLE STREAM RECYCLING SEE OFFICE PAPER	SAME	SAME
Other paper or mixed paper (please list types of paper in your 'other' paper mix)	SINGLE STREAM RECYCLING SEE OFFICE PAPER	SAME	SAME

\*\*Mandatory item that everyone is required to recycle in Connecticut.

RECYCLABLE MATERIAL	AVG WEIGHT (Indicate tons or pounds) COLLECTED FOR RECYCLING EACH MONTH (If you don't have weight data enter the number and size of containers and collection frequency)	HOW & WHERE MATERIAL IS COLLECTED	WHO PICKS-UP MATERIAL AND WHERE IS THE MATERIAL TAKEN FOR RECYCLING
EXAMPLE: Old Corrugated cardboard	We have a 4-yard dumpster behind our main warehouse. It's picked up twice a week.	Warehouse staff collect and flatten boxes as we go along. A small pile is created during a shift (we have 3 shifts/day). At the end of the shift an employee removes the small pile and brings to dumpster outside.	Our current trash hauler, (P&T Trash Hauling, City, CT) empties cardboard dumpster Mondays and Thursdays.
Corrugated cardboard**	SINGLE STREAM RECYCLING SEE OFFICE PAPER	MOST OF THE CARDBOARD IS FLATTENED & BROUGHT TO THE RECYCLE CONTAINER BY EACH DEPARTMENT STAFF OR COLLECTED BY THE JANITOR.	USA HAULING & RECYCLING
Food and beverage containers (check all those collected for recycling) <input checked="" type="checkbox"/> Glass** <input checked="" type="checkbox"/> Metal** <input checked="" type="checkbox"/> plastic <input checked="" type="checkbox"/> paper carton or (juice-type) box	SINGLE STREAM RECYCLING SEE OFFICE PAPER	NUMBERED PLASTIC AND PAPERS ARE SORTED BY EACH EMPLOYEE. THE CONTAINER IS EMPTIED BY THE JANITOR INTO THE SINGLE STREAM DUMPSTER.  SODA CANS & BOTTLES ARE COLLECTED IN SEPARATE CONTAINER BINS IN THE CAFE.	USA HAULING & RECYCLING  THE SODA & BOTTLE ARE TAKEN TO A RECYCLE CENTER & THE MONEY IS DONATED TO THE LOCAL AMBULANCE SERVICE
Other PLASTIC SHIPPING TRAYS 16	108 LBS / MONTH SINGLE STREAM RECYCLING	THE MOLDING OPERATOR INSPECTS EACH TRAY BEFORE USE AND DISCARDS ANY BAD ONES INTO A BLUE RECYCLING CONTAINER. SETUP PERSON EMPTIES CONTAINER INTO THE SINGLE STREAM RECYCLING DUMPSTER	USA HAULING & RECYCLING

\*\*Mandatory item that everyone is required to recycle in Connecticut.

MATERIAL	AVG WEIGHT (Indicate tons or pounds) COLLECTED FOR RECYCLING EACH MONTH (If you don't have weight data enter the "number" and size of containers and collection frequency)	HOW & WHERE MATERIAL IS COLLECTED	WHO PICKS-UP MATERIAL AND WHERE IS THE MATERIAL TAKEN FOR RECYCLING
EXAMPLE: Leaves and other yard debris	N/A	Our landscape company (NAME, TOWN) mows our lawns and maintains our entry garden. They remove all the materials (although grass clippings are left on the lawn).	Our landscape company takes them away.
Leaves**	N/A	BROTHER ASSOCIATES MOWS OUR LAWNS AND MAINTAIN THE LANDSCAPE.	LEAVES ARE COLLECTED & TAKEN AWAY
Grass clippings**	N/A	BROTHER ASSOCIATES MOWS OUR LAWNS AND MAINTAINS THE LANDSCAPE.	GRASS CLIPPING ARE COLLECTED & TAKEN AWAY
Brush, stumps and other yard debris	N/A	BROTHER ASSOCIATES MAINTAINS THE LANDSCAPE.	PICKED UP & TAKEN AWAY AS NEEDED.

\*\*Mandatory item that everyone is required to recycle in Connecticut.

MATERIAL	AVG WEIGHT (Indicate tons or pounds) COLLECTED FOR RECYCLING EACH MONTH (If you don't have weight data enter the number and size of containers and collection frequency)	HOW & WHERE MATERIAL IS COLLECTED	WHO PICKS-UP MATERIAL AND WHERE IS THE MATERIAL TAKEN FOR RECYCLING
Food waste	2-40 GALLON PLASTIC BAGS PER WEEK	FOOD WASTE IS PLACED IN THE 40 GALLON GARBAGE CONTAINERS LOCATED IN THE CAFE. THE JANITOR EMPTIES WEEKLY INTO THE 30 YARD DUMPSTER	THE 30 YARD DUMPSTER IS EMPTIED BY USA HAULING AND RECYCLING.
Other	PLASTIC RUNNERS 2203 LBS / MONTH	PLASTIC RUNNERS ARE DUMPED INTO THE 30 YARD DUMPSTER BY THE MOLDING DEPARTMENT.	USA HAULING & RECYCLING EMPTIES THE DUMPSTER AS NEEDED. USA HAULING LOOKED INTO RECYCLING THE PLASTIC, BUT WITHOUT THE RECYCLING NUMBER ON THE PLASTIC THEY COULD NOT DO ANYTHING WITH IT.
Other	USED WOOD PALLETS 100 PER MONTH	USED WOOD PALLETS ARE COLLECTED AND STORED IN THE GARAGE.	THE PALLETS ARE PICKED UP BY "ALL PALLET RECYCLE"

\*\*Mandatory item that everyone is required to recycle in Connecticut.



RECYCLABLE MATERIAL	AVG WEIGHT (Indicate tons or pounds) COLLECTED FOR RECYCLING EACH MONTH (If you don't have weight data, enter the number and size of containers and collection frequency)	HOW & WHERE MATERIAL IS COLLECTED	WHO PICKS-UP MATERIAL AND WHERE IS THE MATERIAL TAKEN FOR RECYCLING
Food waste OTHER SCRAP IN WAREHOUSE	AROUND 500 LBS PER QUARTER	SCRAP IS COLLECTED IN 55 GAL DRUM AND STORED IN THE GARAGE	G&S, BASED OUT OF EAST HARTFORD Picks THIS UP
Other SCRAP STEEL AND ALUMINUM	500-1000 LBS PER MONTH	THE SCRAP STEEL IS COLLECTED IN A SMALL 15 YARD DUMPSTER IN THE TOOL ROOM CRIP AND EMPTIED INTO THE 8 YARD DUMPSTER OUTSIDE BEHIND THE TOOL ROOM.	USA HAULING & RECYCLING
Other SCRAP COPPER	750-1000 LBS PER YEAR	SCRAP IS COLLECTED IN 55 GAL DRUM AND STORED IN THE GARAGE	G&S, BASED OUT OF EAST HARTFORD, CT Picks THIS UP

\*\*Mandatory item that everyone is required to recycle in Connecticut.

WASTE REDUCTION, REUSE AND OTHER RECOVERY PROGRAMS	PROJECT DESCRIPTION
EXAMPLE: Waste Reduction	Our cafeteria recently began using reusable trays and washing them instead of using styrofoam trays which we were throwing away. We have also instituted a reusable mug program (providing a free mug to employees) to try and reduce the amount of coffee cup waste.
Waste Reduction	OUR CAFE HAS VENDING MACHINES THAT USE PAPER COFFEE/TEE CUPS.
Waste Reduction	CURRENTLY MOST OF THE PLASTIC RUNNERS ARE DISPOSED OF IN THE 30 YARD DUMPSITE. WE HAVE CONTACTED ADIRONDACK PLASTIC AND PAPER RECYCLING TO SEE IF THEY CAN TAKE THE PLASTIC RUNNERS. 2203 LBS/MONTH
Other	
Other	

\*\*Mandatory item that everyone is required to recycle in Connecticut.

WASTE REDUCTION, REUSE AND OTHER RECOVERY PROGRAMS	PROJECT DESCRIPTION
EXAMPLE: ReUse	Our company generates approximately 10 used Gaylord containers/week that we donate to Foodshare for their produce distribution program. We also donate over-stocked and discontinued building supplies to the ReConnstruction Center in New Britain.
ReUse 55 GALLON DRUMS	WE PURCHASE ABOUT 12 55GALLON DRUMS OF ISOPROPYL ALCOHOL PER YEAR. THE USED DRUMS ARE USED TO COLLECT THE SPENT ALCOHOL/OIL HAZARDOUS WASTE, WHICH IS THEN SENT OUT FOR DISPOSAL.
ReUse	
Other	
Other	

\*\* Mandatory item that everyone is required to recycle in Connecticut.

**Recycling & Recovery Programs Planned**

Please use the table below to describe future recycling efforts and how compliance with the mandatory items, if not already recovery for recycling, will be achieved.

IDEA/MATERIAL	ESTIMATED GENERATION RATE	HOW AND WHERE WILL THE MATERIALS BE COLLECTED?	WHO WILL PICK UP THIS MATERIAL? FINAL/END MARKET?	WHEN WILL PROGRAM BE IMPLEMENTED?
EXAMPLE: 5 gallon buckets	15-30 buckets/month	We generate buckets (containing non-hazardous substances) and cannot use them. Will rinse and stack (with lids) off to side of loading dock.	We're trying to secure a connection with a local reuse center or distribute via materials exchange program.	We hope to start this program by the end of August 2008.
RECYCLE PLASTIC RUNNER WASTE FROM THE MOLDING PROCESS	EMPTY CARDBOARD BAYLOADS	WE GENERATE PLASTIC RUNNERS AND HAVE NOT FOUND A COMPANY THAT CAN RECYCLE THEM. THROUGH A BUSINESS SUSTAINABILITY CHALLENGE PROGRAM OUR COMPANY IS TAKING PART IN, WE NOW HAVE A CONTACT FOR THE RUNNERS	AD IRON DACK PLASTIC & PAPER RECYCLING HAS BEEN CONTACTED AND WILL BE MEETING WITH US IN JUNE.	HOPE TO HAVE IT IN PLACE BY AUGUST.
SEPERATE SCRAP STEEL & ALUMINUM	500 LBS STEEL 200 LBS ALUMINUM PER MONTH	STEEL COLLECTED IN THE SMALL 15' X 8' DUMPSTER IN THE TOOL ROOM CRIB. ALUMINUM COLLECTED IN 55 GALLON DRUM ALSO IN THE TOOL ROOM CRIB.	STEEL - USA HAULING ALUMINUM G&S	JULY 2010

**Attachments:** Please include photos of your recycling bins and containers and any copies of recycling/waste contract. If you have additional pages or items to help explain/show successes in your waste recycling/recovery efforts, please attach those as well including brochures, flyers, employee educational materials, etc.

**Reminder:** This form is only required to be submitted when requested by DEP.

**\*\*Mandatory item that everyone is required to recycle in Connecticut.**

Department of Environmental Protection  
Waste Engineering & Enforcement Division  
79 Elm Street, Hartford, CT 06106-5127  
(860) 424-3365  
[www.ct.gov/dep/recycle](http://www.ct.gov/dep/recycle)

Last Updated: January 8, 2009

S:\COMPASS\Business Recycling Profile form & brochures\Business Recycling Profile

**Recycling & Recovery Programs Planned**

Please use the table below to describe future recycling efforts and how compliance with the mandatory items, if not already recovery for recycling, will be achieved.

IDEA/MATERIAL	ESTIMATED GENERATION RATE	HOW AND WHERE WILL THE MATERIALS BE COLLECTED?	WHO WILL PICK UP THIS MATERIAL? FINAL/END MARKET?	WHEN WILL PROGRAM BE IMPLEMENTED?
EXAMPLE: Food and beverage containers (glass, metal and plastic)	25 gallons/month	Will place barrel in break rooms janitorial staff will empty and remove materials to a larger container on our loading dock.	There are a lot of 54 deposit containers. We're looking into having a local non-profit organization collect them for free and redeem the deposits.	We will start this program by August 8, 2008 (12 weeks from now).
EXAMPLE: 55 gallon drums	10/week	We generate 55 gallon drums, which contained <u>non-hazardous</u> substances. We stockpile them outside the plant until we have 50 drums.	Working with XYZ, a company that recycles the drums. We've found this to be more cost effective than recycling them at this time.	We've already started collecting and expect our first pick up to be next week (June 5, 2008)

\*\*Mandatory item that everyone is required to recycle in Connecticut.

# **SINGLE STREAM RECYCLING CONTAINER**

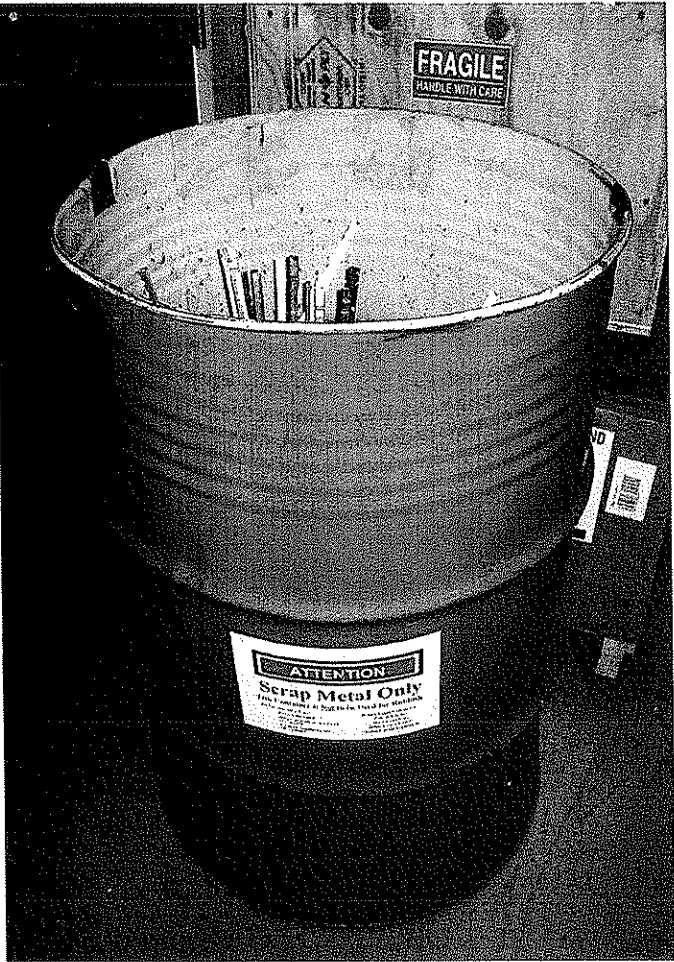
## **ACCEPTABLE ITEMS**

NEWSPAPER/CATALOGS/MAGAZINES  
TELEPHONE/SOFT COVER BOOKS  
PAPER/PAPERBOARD, CEREAL/SHOE BOXES  
MILK & JUICE CARTONS  
PLASTIC BOTTLES & CONTAINERS #1 - 7  
SODA/JUICE/WATER BOTTLES (GLASS OR PLASTIC)  
FOOD CONTAINERS, GLASS/JAR (ANY COLOR)  
ALUMINUM PIE PLATES/TRAYS/FOIL  
METAL CANS (TIN/STEEL/ALUMINUM)

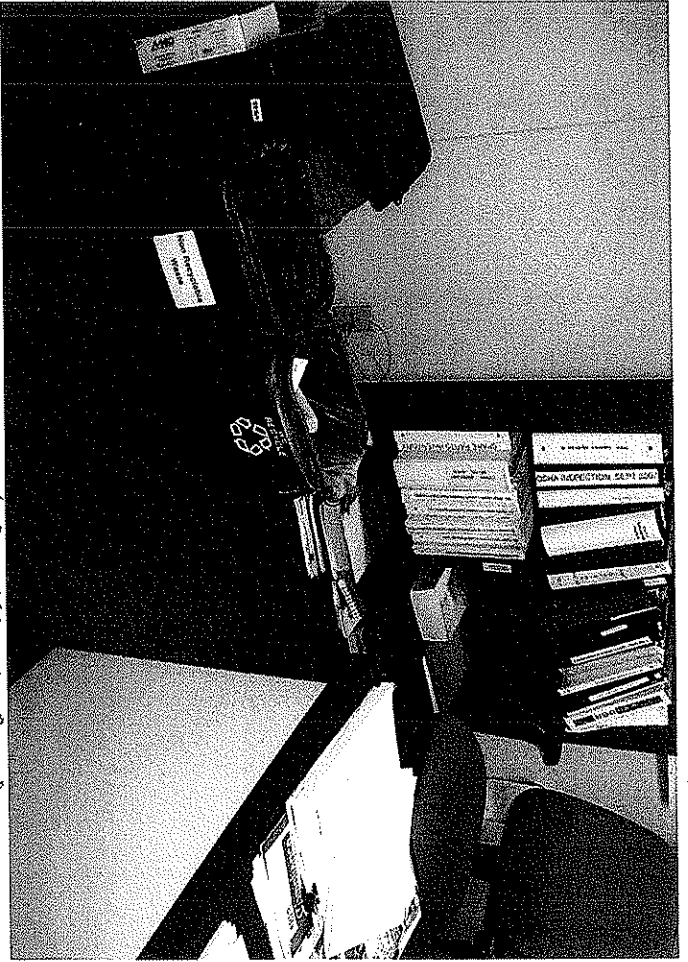
## **UNACCEPTABLE ITEMS**

PLASTIC BAGS/FOOD LINERS  
UNMARKED PLASTIC (NON NUMBERED)  
WINDOW GLASS/LIGHT BULBS  
DISHES/PYREX/CERAMICS  
FOAM PACKAGING/STYROFOAM  
HAZARDOUS MATERIALS  
NO RECYCLABLES CONTAINING FOOD WASTE

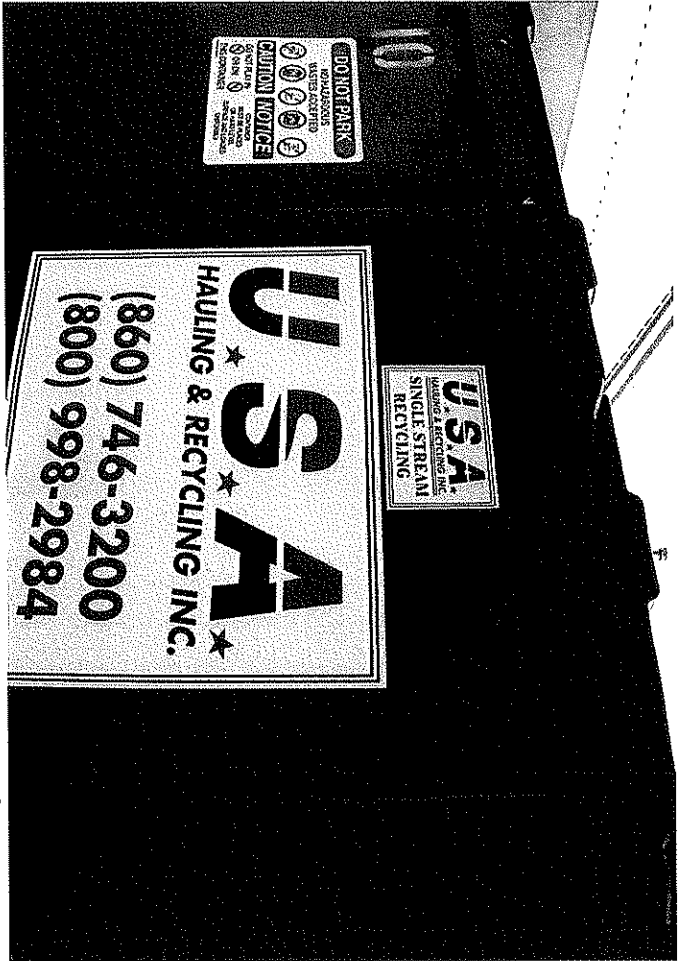
SCRAP ALUMINUM BARREL

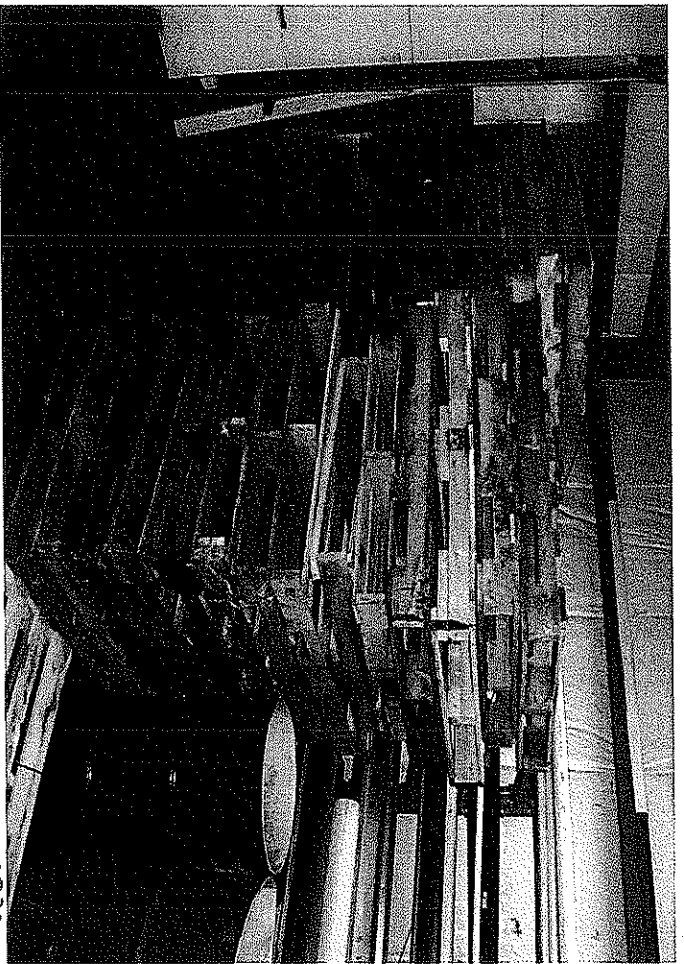


OFFICE WASTE & RECYCLING CANS



SINGLE STREAM RECYCLING DUMPSTER



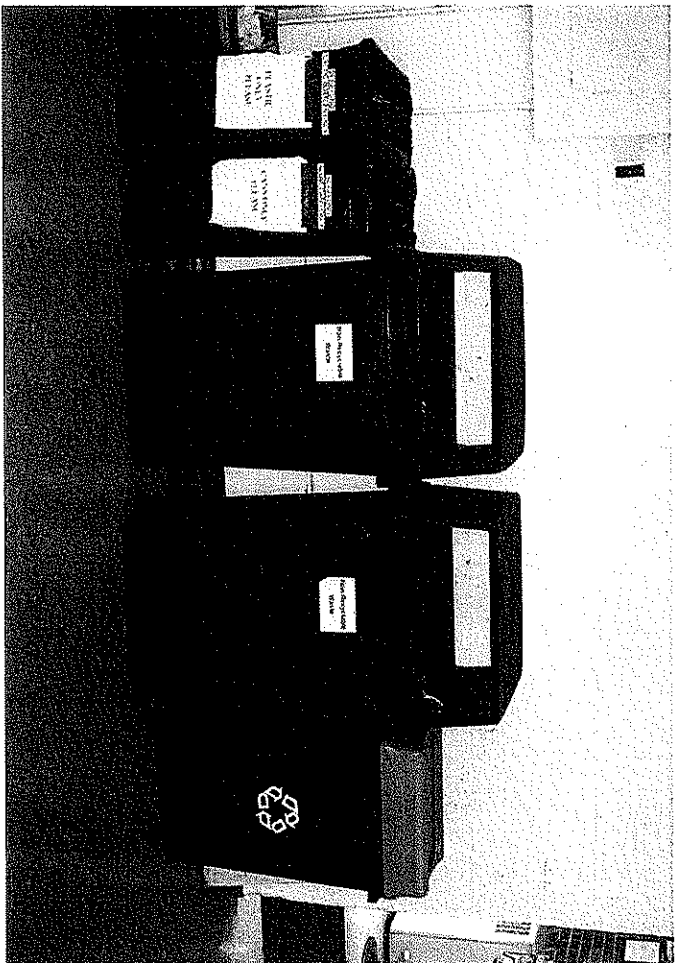


USED PALLET STORAGE

INCOMPIL COPPER



JANITOR'S GARBAGE/RECYCLING CART



CAFE WASTE AND RECYCLING





**ATTACHMENT B**

Approved SEP - Installation of ICP Unit With Laser Ablation Technology

# MEMORANDUM

To: Connecticut Department of Environmental Protection

From: Earl Phillips, Jr., Esq.  
DeringerNey, Inc.

Date: June 17, 2010

Subject: Supplemental Environmental Project Proposal

---

DeringerNey Inc. (DNI) has recently engaged in an evaluation of certain process improvements and potential waste reduction options. As a result, DNI is now proceeding (in the context of a waste reduction /waste minimization Supplemental Environmental Project) to make the investment to purchase certain equipment which will allow for a more complete evaluation of the equipment's ability to reduce certain waste acid generation.

More specifically, DNI engages in chemical analysis and impurity detection as part of its processes in manufacturing products incorporating precious metal alloys at its plant in Bloomfield, Connecticut. Currently, DNI uses an Inductively Coupled Plasma (ICP) unit for these functions. The impurity analysis mentioned above requires detection to the parts per million (ppm) level, and DNI's existing analytical procedure and instrumentation require acid digestion of samples to gain the necessary analytical resolution.

The new ICP instrument that will be purchased as part of this SEP will be equipped with an optional laser ablation accessory. *See* Technical Specifications (attached as Exhibits A and B). DNI intends to evaluate the ability of the laser to generate an aerosol by rastering the laser beam across the surface of a solid sample of the target alloys. The objective will be to create an adequate sample mass for the new ICP to perform its analysis. To the extent this is successful with some or all of the alloys, the waste acid otherwise generated with the current technology and acid digestion process will be reduced or eliminated. Based on technical input and preliminary evaluation by DNI and its consultant, DNI anticipates that this laser ablation technology will be effective in replacing or reducing the use of acid with certain metals. *See* Scientific Abstracts (attached as Exhibits C and D). Despite the fact that studies have not been completed or reported which are on point with the application of this technology to all of the metals handled and analyzed by DNI, it is prepared to proceed with the investment in technology as well as the investment of time and effort to evaluate the potential for waste reduction that is represented by this proposed SEP.

DNI anticipates that the total cost or outlay for this SEP will be in excess of \$100,000. *See* Sales Quotation from Spectro, dated March 29, 2010 (attached as Exhibit E); *see also*

Email correspondence from Earl Phillips to Mohamed Deria and Paul Franson, dated June 16, 2010 (attached as Exhibit F). Given the magnitude of the investment represented by the purchase of this new technology alone, DNI hopes to confirm that its obligation will be met upon confirmation that it has paid for and installed the ICP with the laser ablation technology.

This SEP is consistent with the DEP's Policy on Supplemental Environmental Projects issued March 25, 1993, and revised February 15, 1996. It is a pollution reduction /waste minimization project that goes substantially beyond compliance with existing legal requirements to eliminate waste that would otherwise be generated and discharged. The vendor has represented, and DNI believes, that this technology will have no potential for further damage to the environment.

Exhibit A

# SOLIS-500

## Solids Introduction System

The SOLIS-500 is a unique, compact, and easy-to-use system for the analysis of solid samples. It is designed for the analysis of a wide range of materials, including metals, ceramics, and polymers. The system features a laser ablation source that creates a fine aerosol of the sample material, which is then introduced into the ICP-AES or ICP-MS for analysis. The SOLIS-500 is designed for simplicity and ease of use, making it ideal for laboratories with limited space and budget.



### INNOVATIVE

The SOLIS-500 incorporates a unique mechanism for sample positioning, rastering, and targeting. The design of the rastering mechanism provides precise movement of the laser rather than translating the sampling stage. Thus, the sample platform remains stationary during the ablation process. With the laser targeting device and several sample holders, it is quick and easy to analyze homogeneous ceramic samples and most metals of different shapes and sizes.

### EASE OF USE

Sample setup and analysis takes only minutes since the system contains no viewing optics to adjust. The user simply places a sample in the holder and presses a key to seal the sampling platform. All gas lines are purged using an automatic interlock system requiring no operator intervention. SOLIS-500 incorporates a custom designed sample cell that allows thorough mixing of the fine sample aerosol and allows for efficient transfer to the ICP-AES or ICP-MS.

### FLEXIBLE

Several key parameters can be adjusted via a one-touch keypad control to improve count rate and precision. These parameters include: nebulizer gas flow, raster speed, laser energy and pulse repetition rate. The control system is designed for simple and safe operation.

### Technical Specifications

**Scan rate:** Variable 10, 20, 50  $\mu\text{m}/\text{sec}$ .

**Spot size:** 750  $\mu\text{m}$

**Enclosure:** Class 3 with safety interlocks

**Laser head:** Nd:YAG 0164 nm

**Pulse to pulse stability (%RMS):** 1%

**Energy per pulse:** 50 mJ variable

**Energy drift:**  $\pm 5\%$

**Warm-up time:**  $< 10$  sec.

**Polarization:** Horizontal

**Repetition rate:** 1, 2, 5, 10, 20 Hz

**PRF optimization:** 20 Hz

**Pulse width:**  $< 6$  nsec.

**Pulse timing stability:**  $\pm 20$  nsec.

**Duty cycle:** Continuous

**Power requirement:** 100-240 VAC

**Dimensions (H x W x D):** 58.4 cm x 25.4 cm x 30.5 cm  
(23" x 10" x 12")

**Weight:** 30 kg (66 lbs)

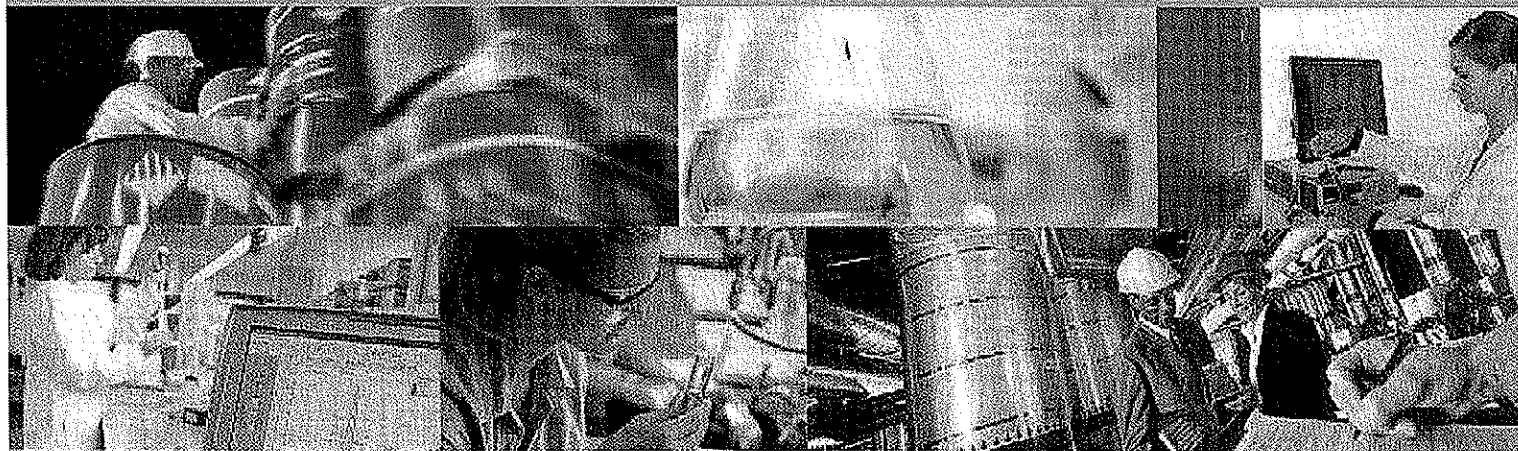
**Warranty:** 12 month limited

Coors Tek (Spectra Arcos Inc)  
Steve Gavrachin  
303-277-4606

Exhibit B

# SPECTRO ARCOS

*High Resolution ICP-CCD Spectrometer for the Most Demanding  
Elemental Analysis Requirements in Industry, Environmental  
Protection and Academia*







# Technical Specifications

## Polychromator

- Thermally stabilized to:  $-15^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$
- Circular design, Paschen-Runge mounting
- Focal length 750 mm
- Holographic grating:  $2 \times 3600$ ,  $1 \times 1800$  grooves/mm
- MgF<sub>2</sub> optical components, Grating material Zerodur
- Wavelength range: 130-770 nm
- Full 1<sup>st</sup> order wavelength coverage
- Entrance slits width: 15  $\mu\text{m}$

## Detector

- 32 linear CCD arrays, 3646 pixels per array
- Pixel resolution: 130-340 nm: 3  $\mu\text{m}$ ,  $>340$  nm: 6  $\mu\text{m}$
- Thermally stabilized optical system
- Parallel readout architecture
- Dynamic range up to 8 orders of magnitude
- Shortest integration time: 1 ms
- Shortest measurement time for one analysis: 2 s
- TCP/IP interface to data processing system

## IIV System

- Patented IIV-PLIS system
- Gas filled (Argon), no consumable purge gas required
- Easy to maintain entrance optics
- Automatic gas purifying system
- Lifetime of purifying cartridge: 12-15 months

## RF-Generator

- Free running type, Frequency: 27.12 MHz
- RF power output: 0.7 to 1.7 kW
- Power efficiency:  $>70\%$ , power stability  $<0.1\%$
- Automatic plasma ignition
- Stand-by mode (low power, low argon)

- Fully computer controlled
- Air cooled (no external cooling required)
- Solid state power supply fully integrated in cabinet

## Dimensions and Weight

- Spectrometer (HxWxD): 1074 x 1610 x 763 mm  
(42.3 x 63.4 x 29.7 inch)
- Footprint (WxD): 1367 x 692 mm (53.8 x 27.3 inch)
- approx. 250 kg (approx. 550 lbs)

## Environmental Conditions

- Room temperature:  $15-35^{\circ}\text{C}$  (59-95  $^{\circ}\text{F}$ )
- Relative Humidity:  $<80\%$  non-condensing
- Atmosphere: free of corrosive vapors and high dust pollution

## Exhaust System Requirements

- Capacity:  $2 \times >250$  m<sup>3</sup> per h ( $>150$  cfm/min)
- separately adjustable between zero and maximum

## Argon Supply Requirements

- Grade:  $\geq 4.6$  (99.996%), pressure: 7.5 bar (108 psi)

## OPI Cooling (EOP only)

- Entrance temperature:  $5-25^{\circ}\text{C}$  (41-77  $^{\circ}\text{F}$ )
- Flow rate: 1.5-2.5 l/min (0.4-0.7 gal/min)
- Water pressure: 1-5 bar (14.5-72.5 psi)

## Electrical Requirements

- 230 VAC  $\pm 5\%$ , 50/60 Hz
- approx. 4.5 KVA power consumption
- 30-32 A instrument required line protection (slow blow fuse)

[www.spectro.com](http://www.spectro.com)

**AMETEK**  
MATERIALS ANALYSIS DIVISION



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Fax: +49-2821-89222-02  
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Exhibit C

## REVIEW

# Laser ablation inductively coupled plasma mass spectrometry: achievements, problems, prospects†

Steven F. Durrant

Laboratório de Processos de Plasma, DEA, IFGW, Universidade Estadual de Campinas (UNICAMP), CP 6165, 13083-970, Campinas, SP, Brazil

Received 4th March 1999, Accepted 25th May 1999

- 1 Introduction
- 2 Evolution of LA-ICP-MS
- 3 Laser principles
  - 3.1 Ruby
  - 3.2 Nd:YAG
  - 3.3 Excimer
- 4 Laser ablation systems
- 5 Laser-solid interactions
- 6 Particle transport
- 7 Optimization
- 8 Calibration strategies
- 9 Performance and problems
- 10 Growth areas
  - 10.1 Fingerprinting
  - 10.2 Geological microprobe analysis
  - 10.3 Isotope ratios
- 11 Prospects
- 12 References

## 1 Introduction

Houk *et al.*<sup>1</sup> first demonstrated the combination of an argon inductively coupled plasma (ICP) and a quadrupole mass spectrometer for elemental analysis of aqueous sample solutions. The technique, now known as inductively coupled plasma mass spectrometry (ICP-MS), developed rapidly, especially after the launch of commercial instruments in 1983–84, and is now a standard method for multi-elemental and isotope ratio analysis of diverse biological and geological samples.<sup>2</sup> Recognized advantages of ICP-MS include direct analysis of solutions, calibration against aqueous standards, pg ml<sup>-1</sup> detection limits for many elements, a wide elemental coverage and a linear dynamic range of up to 10 orders of magnitude. Although the use of aqueous solutions is usually both convenient and successful, analytical difficulties sometimes arise. Matrices such as milk powder or tea leaves resist dissolution, necessitating the use of potentially hazardous reagents such as H<sub>2</sub>O<sub>2</sub> and HF. Moreover, any sample handling involves the risk of contamination and the loss of volatile elements. In addition, dissolution procedures are laborious to develop and even when successful require hours (or days) to perform. Hence sample preparation becomes the limiting factor in the analytical procedure. Another analytical difficulty is the presence of spectroscopic or non-spectroscopic interferences in the sample analysis.<sup>3</sup> Well known examples of these are the polyatomic species <sup>40</sup>Ar<sup>35</sup>Cl<sup>+</sup>, which complicates the determination of (monoisotopic) arsenic at *m/z* 75, and the suppression of analyte responses in the presence of a high concentration of an easily ionized element (e.g., of trace elements in brines). Dissolution reagents often contribute elements that are inter-

ferents with isotopes of analytical interest or that are incorporated into polyatomic interferences.

Motivated partly by such difficulties, alternative sample introduction methods such as direct sample insertion (DSI),<sup>4</sup> electrothermal vaporization (ETV),<sup>5</sup> spark ablation (SA)<sup>6</sup> and laser ablation (LA)<sup>7</sup> began to be used with ICP-MS. The ability of the ICP to accept vapours and solid aerosols produced by such methods for atomization and ionization was already known from optical emission spectrometry (OES). Indeed, development of these sample introduction techniques for ICP-OES continues in parallel with their use in ICP-MS.

Ablation of solids using pulses from a laser and carriage of the released material to the ICP in a gas flow, usually of argon, is a very attractive alternative to the nebulization of aqueous sample solutions. In addition to the usual analytical advantages of ICP-MS, LA offers reduced sample preparation, rapid sample exchange and throughput, reduced spectral interferences and the possibility of *in situ* spatially resolved analysis. The key challenge in LA-ICP-MS, evident from the first feasibility study of the technique, which employed pulses from a ruby laser,<sup>7</sup> is to obtain fully quantitative analyses. Developments in both laser systems and spectrometer technology are beginning to meet this challenge.

In this paper, the development, performance and future prospects of LA-ICP-MS are discussed. The diverse and successful applications of the technique to biological, geological and metallurgical samples are selectively illustrated from the literature, which is now extensive.<sup>7–229</sup> Only articles published in international journals in English by September 1998 have been considered. Apologies are given in advance for any important literature that has escaped my net. It is appropriate here to refer the reader to some key papers. Fundamental aspects of laser probes, including laser hardware and operation, laser-sample interactions and laser ablation combined with OES, atomic absorption spectrometry (AAS), atomic fluorescence spectrometry (AFS) and mass spectrometry (MS) are dealt with by Moenke-Blankenburg.<sup>230–232</sup> The literature on laser-solid interactions is also extensively covered by Dittrich and Wennrich.<sup>233</sup> Diverse applications of lasers, including some early LA-ICP-MS literature, are examined by Darke and Tyson.<sup>234</sup> In a narrower review, Radziemski<sup>235</sup> discusses analytical applications of laser plasmas published between 1987 and 1994. These papers provide a grounding in the physical principles of laser ablation.

In 1985, Gray reviewed the emergence of ICP-MS in a paper entitled 'The ICP as an Ion Source—Origins, Achievement and Prospects',<sup>236</sup> hence the title of the present paper. Today, considering only analytical journals, there are about 2000 articles dealing with ICP-MS, hence a comprehensive review of ICP-MS would not fit comfortably within the compass of a single paper. The incentive for the writing of the present paper lay not only in the exciting new developments occurring in LA-ICP-MS but also in the rapidly growing literature, which is ripe for consolidation. Not every aspect of

Use of laser ablation reduces need for liquid (acid) digestion

†Presented at the 1999 European Winter Conference on Plasma Spectrochemistry, Pau, France, January 10–15, 1999.

JAS

Journal of  
Analytical  
Atomic  
Spectrometry

Exhibit D



## **LASER- AND ICP-INDUCED ELEMENTAL FRACTIONATION IN LA-ICP-MS**

D. Guenther (1), S. Jackson (2), and M. Guillong (1)

(1) ETH Zürich, Laboratory of Inorganic Chemistry, Hönggerberg G113, CH-8093 Zürich, Switzerland. (2) Macquarie University, GEMOC National Key Centre, Department of Earth and Planetary Sciences, Sydney, Australia (guenther@inorg.chem.ethz.ch)

Laser ablation inductively coupled plasma mass spectrometry is now well established as a very powerful analytical technique for in situ trace element quantification and isotope ratio determinations in minerals, metals, synthetic samples, and inclusions therein. Studies using various laser wavelengths have been carried out in an effort to establish the best laser system for routine applications using both single and multi-collector ICP-MS instruments. Several wavelengths between 1064 nm and 157 nm have been evaluated, and it has been shown that the degree of elemental fractionation (change of measured within and between element isotope ratios with time) is related to the laser wavelength used. However, the contribution of several processes (ablation, particle and vapour transport, particle vaporisation, atomisation and ionisation) in LA-CP-MS is still not fully understood. In this report, the individual processes of particle mobilisation, particle transport and the particle behaviour in the ICP will be discussed. The distribution of particle sizes from different matrices was measured, and it has been demonstrated that the wavelength and the ablation gas environment change the particle size distribution. That smaller particles are produced when using shorter wavelengths has been shown in studies which used 1064 nm, 266 nm, 213 nm and 193 nm laser wavelengths. It also has been shown that particles with diameters greater than 200 nm contribute insignificantly to the measured signal intensity, and that only a small fraction of the material which is transported to the ICP produce ions which are detected. Various experiments using in line filters to remove the larger particles show that the material collected on the filter has the elemental and isotopic composition of the original sample. The measured ICP-MS signal intensities show that both ICP-induced elemental and ICP-induced isotopic fractionation does occur. Fractionation

effects in the laser-produced aerosol are only found when applied laser energies are close to threshold conditions. Based on these observations a newly designed 193 nm Nd:YAG solid state laser system was constructed, which can produce 266 nm, 213 nm and 193 nm energies from the same fundamental 1064 nm wavelength using an Optical Parametric Oscillator and conventional frequency multiplying crystals. With this new innovative system it was possible to carry out a bona fide study of the comparison of several different wavelengths, with nearly identical optics. Data obtained using this new system will be presented, showing differences in the ablation behaviour using three different wavelengths and the implications for routine analytical, especially geological, applications.

Exhibit E



SPECTRO Analytical Instruments Inc.  
91 McKee Drive, Mahwah, NJ 07430  
Tel. +1.201.642.3000 - Fax. +1.201.642.3091  
info@spectro.com - www.spectro.com

3/29/2010

Ms. Cynthia Newton  
Derringer Ney  
Ney Industrial Park  
Bloomfield, CT 06002  
Phone: 860-242-2281

Reference: Quotation #: A

Dear Ms. Newton:

Your Spectro team is pleased to provide you with the following quote for a **Spectro ARCOS EOP** instrument. We are confident that the Spectro unit described will offer you a very reliable and cost effective solution to your analytical requirements as well as provide you with optimum performance, possible only through Spectro's unique design characteristics.

Spectro's quality, reliability, service and analytical support are unsurpassed in this industry. In order to demonstrate what you should expect in a spectrometer system, we would encourage you to see a Spectro system in use and discuss with a Spectro Sales Engineer those instrument attributes critical to reliable analytical results.

Our proposal includes a detailed description of each item listed. If you have any questions or if you would like to discuss these items in greater depth, please call your local contact, Alan Merrick.

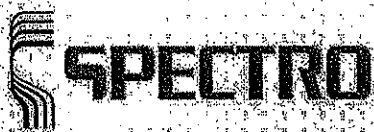
For information regarding instrument finance and lease options through Spectro Financial Services, please contact Tammy Grimshaw at 973-292-0025.

Sincerely,

*Marjorie A. Greimel*

Marjorie A. Greimel  
Sales Administrator

Your Local Contact: Alan Merrick (203) 778-8837



SPECTRO Analytical Instruments Inc.  
91 McKee Drive, Mahwah, NJ 07430  
Tel: +1 201 642 3000 - Fax: +1 201 642 3091  
Info@spectro.com - www.spectro.com

## Sales Quotation

### Prepared for:

Ms. Cynthia Newton  
Derringer Ney  
Ney Industrial Park  
Bloomfield, CT 06002  
Phone: 860-242-2281

Quote Number: 1003035A

Date: 3/29/2010

Valid through: 3/31/2010

Item	Part #	Description	Price	Qty	Extend
1	76004553	SPECTRO ARCOS EOP - Simultaneous GCD based axially viewed spectrometer. 0.75M Roland Circle optical system with resolution as high as 0.008nm. Wavelength coverage from 130nm to 770nm. Features End On Plasma (EOP) view with UV Plus and Optical Plasma Interface (OPI). Includes per-pump, computer, HP Deskjet printer (US) and 17 inch monitor. Electrical requirements: 230V +/- 5%, 60 HZ, Single Phase, 30 amps. Includes LabSpeed Topos Software.	\$90,291.86	1	\$90,291.86
2	75170539	Country Accessory US	Incl.	1	\$0.00
3	76100021	Cooling System 115 V, 60 Hz	\$4,463.66	1	\$4,463.66
4	76280002	XYZ Autosampler ASX-260 - Includes 2 trays x 21 sample positions of 50 ml capacity. Optional trays available to increase sample from 42	\$6,256.12	1	\$6,256.12
5	78000003	Bench for Arcos 1500 x 750 x 743 mm ( W x D x H )	\$1,606.96	1	\$1,606.96
6	78000002	Bench for Accessories 900 x 750 x 743 mm ( W x D x H )	\$1,207.34	1	\$1,207.34
7	Install	INSTALLATION & TRAINING (24 hours on site)	\$2,950.00	1	\$2,950.00
8	Software	Upgrade existing CIROS ICP software to Smart Analyzer Vision, version 2.11	\$4,000.00	1	\$4,000.00
9	Training	Extra two days of on-site training specific to laser ablation accessory	Incl.	1	\$0.00
Subtotal					\$110,775.94
Credit for recent service to existing Spectro CIROS ICP			(\$13,406.00)	1	(\$13,406.00)
Optional Items					
CETAC	Cetac Solis Laser Ablation System		\$35,000.00		
Spectro and Cetac are willing to credit the Solis Laser Ablation System toward purchase of a LSX-500 should results of the Infrared laser-based system prove unsatisfactory to Derringer Ney.					
Purchased just for solid sampling					

Purchased just for solid sampling  
Where applicable,  
Eliminates need for acid digestion.





SPECTRO Analytical Instruments, Inc.  
91 McKee Drive, Mahwah, NJ 07430  
Tel. +1.201.642.3000 - Fax. +1.201.642.3091

## TERMS AND CONDITIONS

Quote Number: 1003035A  
Date: 3/29/2010  
Valid through: 3/31/2010

### Order Acknowledgment

SPECTRO will send an order acknowledgment when a Purchase Order is accepted.

### Passing of Ownership

The instrument will remain the property of SPECTRO ANALYTICAL INSTRUMENTS, INC. until paid in full.

### Installation and Commissioning

Travel costs, labor and expenses are included in the installation cost. Installation and commissioning will be performed by a qualified Spectro installation engineer. During this time, it will be demonstrated that all modes and the analytical system is working correctly and as specified. At the completion of the installation, an acceptance report will be issued and signed. Unless otherwise stated, delivery, installation, and warranty are for the United States only.

In addition to on-site training during installation, Spectro Analytical Instruments, Inc. offers training seminars throughout the year at the Mahwah, New Jersey facility. Current pricing and course schedules are available from our Customer Service Department at (201) 642-3000.

### Warranty

The warranty period is 12 months from date of installation or 18 months from date of shipment, whichever occurs first. The warranty includes parts, labor, and travel expenses. Spectro warrants the instrument under conditions of operation against defects of material and workmanship. The warranty does not include any repair due to customer's negligence, incorrect gas and power supply or improper sample preparation. Warranty does not include any consumables, maintenance, or additional operator training.

### Technical Specification

We reserve the right to change the technical specifications at any time if necessary for technical progress.

### Prices

Prices are excluding all taxes. Orders cancelled within 7 days of acceptance of the order, are subject to a cancellation fee of 10% of the contract value. Orders cancelled after 7 days of acceptance, are subject to a cancellation fee of 20% of the contract value.



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## Sales Quotation

**Prepared for:**

Ms. Cynthia Newton  
Derringer Ney  
Ney Industrial Park  
Bloomfield, CT 06002  
Phone: 860-242-2281

**Quote Number:** 1003035A

**Date:** 3/29/2010

**Valid through:** 3/31/2010

Item	Part #	Description	Price	Qty	Extend
		<b>Note</b>  Spectro Financial Services offers \$1.00 Purchase Option: \$1981.48/month for 5 years. Additional operating, lease, rental programs available as well.			

**Total Price:** Price excludes all taxes & freight charges unless otherwise stated in the quotation. If Tax exempt, please see enclosed Sales Tax statement.

**STANDARD TERMS UNLESS ALTERED BY LINE ITEM ABOVE:**

**Payment Terms:** 20% down payment with purchase order  
75% on delivery and prior to installation  
5% after installation and system sign-off, or 90 days  
from date of shipment, whichever occurs first

**Delivery:** 8 weeks (after receipt of order)

**FOB:** Origin

Marjorie Greimel, Sales Administrator *Marjorie A. Greimel*

**Total Price: \$97,369.94**

**SALES TAX:** Please provide your tax rate along with the city and county where the unit is to be shipped. If this purchase is non-taxable, provide appropriate documentation. (e.g.: Tax Exemption Certificates, Re-sale Certificate, or Direct Payment Certificate.)

Exhibit F

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**Subject:** RE:

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**From:** Phillips, Earl  
**Sent:** Wednesday, June 16, 2010 5:44 PM  
**To:** 'Mohamed.Deria@ct.gov'; 'Franson, Paul'  
**Cc:** Phillips, Earl; Jim Cummings; 'Lee Trimble'; Jameson, Kathy  
**Subject:** FW:

Paul and Mohamed,

I am writing to respond to your request for certain additional information to evaluate the proposed SEP.

1. While we do not have specific representations on point relative to the laser ablation system's effectiveness with the unique precious metal applications at DeringerNey (DNI), we have requested representations from the vendor. In the interest of time, I am providing certain technical abstracts which were considered in selecting this technology and its waste reduction potential.

2. The response from DNI which is provided below reflects the cutting edge nature of this particular waste reduction approach. Please note that while DNI hopes that the new technology will be highly effective in reducing or eliminating the need for acid digestion and waste acid production, it has taken a very conservative approach to projecting success and provided a conversion at the 20% success level. Naturally, computations can be done at higher levels.

DNI Response: DNI currently generates waste acid in its analytical lab. The volume is appx. 135 lbs. per month/ 1620 lbs. per year. At a 20% success rate this would result in a reduction of 27 lbs. per month/ 325 lbs. per year. Actual success rate is unknown at this time.

3. Similarly, the DNI response provided below has provided a very generous number (value) for the potential savings. While I mentioned it in our earlier conversations, it is important that I again say that it is possible that there will be no savings and that significant additional expense associated with purchasing and installing the new equipment will be part of this SEP. This is particularly true if the system is not effective with all or most alloys.

DNI Response: Savings or return on investment will be a function of utilization. Taking an optimal use in which rate of approximately 20 hours per month might be saved and multiplying this by an hourly rate of between \$25. and \$50. per hour, even at the higher rate of \$50. per hour, this converts to roughly \$12,000. per year or something in the neighborhood of a 12 year return on investment.

4. Schedule: Lab site prep - June/July 2010  
Equipment installation - August-October 2010  
Commence operation and evaluation - September-November 2010

We certainly hope that this will allow us to now proceed with the Consent Order for the expedited settlement. Please feel free to call with any questions. My direct dial is 860-275-8220 and my cell is 860 604-9463.

Sincerely,

Earl

6/17/2010

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Earl,

Responses to items under #2 below:

- i See attachments . We are still waiting for the Vendor input.
- ii Currently we are generating approximately 135# of acid waste per month (1620# per year)in the analytical lab. With a 20% success we would see a 27# reduction per month or 325# reduction per year. As stated the success anticipated is unknown at this time.
- iii Savings associated with the purchase of this equipment is roughly 20 labor hours per month at a \$50 rate yielding \$12,000 per year or 12 year ROI.
- iv Implementation schedule:

Lab site prep : June / July

Equipment install : August / September

Commence operation : September /October

Let me know if you need anything else.

Thanks,

Jim

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