



## Project XL: IBM Essex Junction, Vermont

### WHAT IS PROJECT XL?

Project XL, which stands for “eXcellence and Leadership,” is a national initiative that tests innovative ways of achieving better and more cost-effective public health and environmental protection. The information and lessons learned from Project XL are being used to assist the U.S. Environmental Protection Agency (EPA) in redesigning its current regulatory and policy-setting approaches. Project XL encourages testing of cleaner, cheaper, and smarter ways to attain environmental results superior to those achieved under current regulations and policies, in conjunction with greater accountability to stakeholders. It is vital that each project tests new ideas with the potential for wide application and broad environmental benefits. As of July 2000, twenty-six pilot experiments are being implemented and over thirty additional projects are in various stages of development.

### SUMMARY OF THE IBM-VT PROJECT

IBM’s Essex Junction, Vermont, semiconductor facility recently introduced a new, innovative copper metallization step into their semiconductor chip manufacturing process. This new process is significantly more energy efficient than its predecessor, produces chips that are faster and more energy efficient, and greatly reduces the use of Perfluorinated Compounds (PFCs), which are greenhouse gases, for chamber cleaning. However, because this process uses an electroplating technique, the treatment of the rinsewaters, which are combined with other process wastewaters generated at the facility, generates sludge that is currently regulated under the Resource Conservation and Recovery Act (RCRA) as F006 waste. IBM maintains that the F006 classification fails to provide any additional environmental protection, and imposes a regulatory burden on a process that does not use any materials that were the basis for the original listing and therefore should not be subject to those regulations. Through Project XL, IBM seeks a site-specific exemption from the RCRA F006 listing for the copper metallization process. In addition, IBM has engaged in other voluntary efforts to reduce greenhouse gas emissions in its remaining silicon dioxide chamber cleaning processes.

### SUPERIOR ENVIRONMENTAL PERFORMANCE

Several benefits will result directly from the site-specific exemption for the copper metallization process. These benefits include:

- < A reduction in the quantity of waste defined as hazardous generated by the Essex Junction facility;
- < A rationalization of the RCRA F006 listing as it applies to this process;
- < The minimization of the use of PFCs, which are greenhouse gases, used as chamber cleaning compounds in the manufacturing process;

< A decrease in the IBM, State of VT, and EPA administrative requirements.

Perhaps the most notable benefit to this XL project is that it highlights and promotes a new process - copper metallization - which has the potential to impact the electronics industry in profound ways. This new process is approximately 30-40% more energy efficient than the previous one and produces a chip that is approximately 25% more energy efficient than its predecessor. If this process is eventually used by other semiconductor facilities, the results of this project may encourage more efficient production methods with corresponding reductions in waste generation per unit output, as well as other benefits associated with energy efficiency, such as natural resource conservation, air quality improvements, and decreased impact on climate change.

#### **FLEXIBILITY**

IBM has proposed that EPA exempt the wastewater treatment sludge produced from this new copper metallization process from the RCRA F006 definition through a site-specific rulemaking. Through this proposal, IBM seeks to exempt the manufacturing process -- specifically copper metallization -- rather than delisting the wastewater treatment sludge, which would normally occur through EPA's delisting process under RCRA regulations.

#### **STAKEHOLDER INVOLVEMENT**

IBM solicited input on this project from a wide range of stakeholders including local and national environmental groups, neighborhood associations, and industry trade associations. Stakeholders were notified of this project by direct mail, telephone, and announcement in the local press. Additional information is available from the project contacts as well as EPA's website.

#### **APPROACHES TO BE TESTED**

The Agency is evaluating whether IBM's process is capable of generating a hazardous waste rather than conducting an "end of pipe" analysis of the wastewater treatment sludge. This approach can provide the Agency with a new methodology for evaluating the applicability of its regulations to specific activities.

#### **CONTACTS**

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#### **FOR ELECTRONIC INFORMATION**

More information about Project XL is available on the Internet at <http://www.epa.gov/ProjectXL>, or via Project XL's Information Line at 202-260-5754.