

**SHARING THE LOAD:  
Effluent Trading for Indirect Dischargers**

*Lessons from the New Jersey Chemical Industry Project--  
Effluent Trading Team*

*Final Report  
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## PREFACE

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The Environmental Protection Agency's Industry Strategies Division is working with the New Jersey Department of Environmental Protection, US EPA Region 2, and a Stakeholder group made up of industry, environmental group, union, and community representatives on a project with the batch chemical manufacturing industry in New Jersey. The New Jersey Chemical Industry Project is an effort to assess current environmental protection strategies on a sector basis and develop better approaches.

The project started by asking what inspires companies to achieve — or keeps them from achieving — better environmental performance. From this information, the Stakeholder group developed a list of 45 issues for possible pilot projects to test new environmental protection strategies. The Effluent Trading Pilot was developed as one of four pilot projects selected by the New Jersey Chemical Industry Project Stakeholder group. The other pilots selected by the group include: reuse of "waste" materials across facilities, compliance assistance, and flexible track for good environmental performers.

A subset of the Stakeholder group formed the Pilot Team for the Effluent Trading Pilot, along with several additional experts who were invited to participate. The Pilot Team worked together to facilitate trading of local effluent pretreatment limits within the Passaic Valley Sewerage Commissioners' treatment area. This report documents the lessons learned from establishing a trade of pretreatment limits, as well as providing information on the structure and background of the trade. It is hoped that this information will be helpful to others seeking to establish effluent trades, especially among industrial dischargers.

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## ACKNOWLEDGMENTS

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This project benefited from the dedication, enthusiasm, creativity, and technical knowledge of the participants in the Effluent Trading Pilot Team of the New Jersey Chemical Industry Project. Through the efforts of the Pilot Team, the expertise and perspectives of industry, regulatory agencies, and environmental groups have been incorporated throughout the definition, implementation, and documentation of this pilot project. The Pilot Team would like to thank the Passaic Valley Sewerage Commissioners for implementing effluent trading in their service area, as well as Robert J. Davenport, the Commissioners' Executive Director, for encouraging his staff to participate in this project and allowing them to invest the time necessary to complete it successfully.

This report was drafted by several Pilot Team members, including Frank D'Ascensio, Passaic Valley Sewerage Commissioners; James Murphy, New Jersey Department of Environmental Protection; Eric Ruder, Industrial Economics, Inc. (IEc); Suzette Apis, IEc; and Harriet Greenwood, IEc. In addition, the following Pilot Team members contributed their ideas and suggestions for improvement: Barry Bochner, Fabricolor, Inc.; Joseph Gentile, CasChem; Wayne Tamarelli, Dock Resins Corporation; Daniel Watts, New Jersey Institute of Technology; and Ella Fillippone, Passaic River Coalition. We would also like to thank the EPA staff members who contributed to this report, especially those from the Office of Policy, Planning and Evaluation, Industry Strategies Division and Emerging Strategies Division; Office of Water, Permits Division and Assessment and Watershed Protection Division; and Region 2, Division of Environmental Planning and Protection and Division of Enforcement and Compliance Assistance. The success of this pilot project is a result of valuable contributions from the entire Pilot Team. A complete list of the Pilot Team members can be found on page iii.



# NEW JERSEY CHEMICAL INDUSTRY PROJECT

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## THE EFFLUENT TRADING PILOT TEAM

### New Jersey Chemical Industry Project Stakeholders

Barry Bochner	Fabricolor, Inc.
Frank D'Ascensio	Passaic Valley Sewerage Commissioners
Joe Gentile	CasChem
Stan Siegel	EPA Region 2, Division of Environmental Permitting and Protection
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**The Effluent Trading Pilot**

The Effluent Trading Pilot project explored the use of a "trading" mechanism as a means for companies to meet local pretreatment limits for the level of metals in the effluent they discharge to a Publicly-Owned Treatment Works (POTW). Trading allows industrial permittees to achieve the required overall additional reductions in pollutant levels more economically. Controlling metals levels in effluent can be very expensive. Yet when the control measures are instituted, a facility may be able to reduce the levels of metals in its effluent more than is required. For some facilities, instituting the control measures would be so expensive that they would have to shut down some production processes or go out of business. Trading allows facilities within the same POTW service area to work together to control the discharge of metals in a manner that is less expensive for all parties. A company that has instituted control measures that have brought its metals levels down below the local limits can "sell" these excess reductions. One or more companies with effluent levels in excess of the local limits can buy the reductions as a means of complying with the local limits. A buying company and a selling company negotiate a price for the metals credits, and the permits of the trading partners are adjusted to reflect the amount of credits sold in the trade.

The Passaic Valley Sewerage Commissioners (PVSC) operate a large treatment plant in Newark, NJ that treats the domestic and industrial wastewaters of northeastern New Jersey. The heavily industrialized service area encompasses all of the land draining into the Passaic River from the Great Falls in Paterson to Newark Bay. This area consists of 47 municipalities in portions of Passaic, Bergen, Essex, and Hudson counties with a total population of about 1.3 million. There are 306 major industrial plants within the PVSC service area. In order to meet local pH and heavy metals limits, approximately 236 of these facilities need to treat their effluent prior to discharging it to the PVSC sewer system. Exhibit 1-1 shows the communities within the PVSC service area.

The Pilot Team worked with PVSC and its industrial permittees to establish a trade of local pretreatment limits for metals. To accomplish this, the Pilot Team facilitated the process of identifying potential trading partners and negotiating a trading agreement. The pilot project began in November 1996. The Pilot Team first contacted each of the industrial dischargers in the PVSC

service area to ask if they would be interested in working with other facilities to establish trades. Interested companies were invited to a meeting at which the framework for trading was described and questions concerning trading were answered. The Pilot Team continued to assist these companies in their efforts to establish trades over the next several months and eventually oversaw the drafting and approval of a trading agreement between two facilities that took effect on July 1, 1997.

## **Summary of Key Findings**

Prior to this pilot project, no effluent trade was in place between companies discharging effluent to a POTW. Because of this, the Pilot Team decided that an important aspect of this project would be to document its experience establishing effluent trades. Through this report, the Pilot Team hopes to share the lessons learned during this project concerning the benefits of trading, as well as barriers to trading and approaches to overcoming them. This section highlights some of the key findings of this effort to establish effluent trading. These and other findings are described in greater detail in subsequent chapters of this report.

## **Benefits of Trading**

Effluent trading among indirect dischargers within a sewer service district can produce a variety of benefits for the environment, industrial facilities, and the POTW itself. Trading among facilities in the PVSC service district benefits the environment because the rules and regulations governing trading in this district require that trades incorporate an overall reduction in the amount of pollutants discharged from participating facilities. Trading also provides greater flexibility to facilities in meeting local limits. This flexibility encourages wider and more timely compliance with local pretreatment limits and can lead to economic savings for facilities that buy and sell effluent credits, which ultimately can help to sustain local economic conditions. The POTW benefits from trading through an enhanced public image as a proactive and effective regulatory agency that is concerned with ensuring that facilities meet local limits that are protective of the environment, while alleviating any potential negative impacts of regulations on the local economy by allowing them to pursue innovative compliance approaches.

## **The Trading Process**

The Pilot Team spent considerable effort exploring the process of establishing trades to identify both key steps in trading and some of the barriers that facilities face as they attempt to establish trades. Several of these steps and barriers are highlighted below.

- **Need for local regulations authorizing trading** — Trading of pretreatment limits is possible only for local limits since there is no allowance for trading of Federal (categorical) limits. However, in order for trading to occur in a given POTW service district, the POTW must first incorporate trading into its rules and regulations. As such, POTWs may want to consider issuing trading regulations even if there appears to be little demand for it among their industrial permittees at the current time. This will streamline the process

should trading become a desirable compliance tool and allow facilities to implement trades to meet local pretreatment requirements more quickly and efficiently.

- **Timing of trading negotiations** — The Pilot Team concluded that it is most productive for the concept of trading to be introduced to the industrial user community at the same time new local pretreatment limits are being developed or existing ones are being revised. This allows potential trading partners to begin discussions early on in the process of planning how they will meet the new or revised limits. Early discussions can improve their ability to develop and implement more economical and efficient approaches to treatment that fully consider the potential for a coordinated approach to pretreatment among several trading facilities.
- **Lack of information** — This was identified as a significant barrier to establishing trades under this pilot project. During the course of this effort, the Pilot Team attempted to address this through conducting extensive outreach to PVSC industrial permittees to inform them of the potential to use trading as an approach to meeting the upcoming compliance deadline for PVSC's local limits and to assist them in identifying suitable trading partners. The experience of the Pilot Team suggests that the process of developing trades in other POTW service districts would benefit from either establishing similar trading teams or POTWs taking a larger role in promoting and facilitating trading negotiations.

### **Transferability of Trading to Other POTWs**

Through the Effluent Trading Pilot in the PVSC service district, the necessary measures and factors to be considered when developing a trading program were identified, and a number of stumbling blocks to moving a trading program from theory to implementation, along with solutions, were documented. The following information should be useful in considering whether and how effluent trading can be successfully extended to other POTW service districts.

- There is no magic number of permittees a POTW should have in order to establish a trading program. Special circumstances, such as a shared need among permittees for a similar type of treatment facility, can make trading appropriate even for a POTW with a small number of permittees.

- The ability of a POTW to implement trades relies on three factors:
  - ▶ Having technically-based defensible local pretreatment limits — This allows a POTW to readily address any questions regarding the adequacy or appropriateness of the local limits to which trading applies.
  - ▶ Incorporating trading into its rules and regulations or sewer use ordinance — POTWs can implement programs for trading local pretreatment limits, but must first establish the proper legal authority through their rules and regulations.
  - ▶ Having or establishing a strong pretreatment enforcement program — This provides incentives for industrial permittees to seek alternative methods for achieving compliance and sends a clear message that they will be held accountable for meeting the terms of their trades. It also fosters public confidence that the POTW will effectively oversee trades while continuing to protect human health and the environment.

### **Organization of this Report**

The following chapters of this report document the benefits and challenges of establishing this effluent trade and explore the transferability of trading to other POTWs. Chapter 2 provides background on PVSC and its regulations that allow for trading to meet local limits. Chapter 3 summarizes the benefits of a trading program — for the environment, industry, and POTWs. Chapter 4 outlines the key elements that the Pilot Team feels are necessary for establishing a successful trading program and provides more general background information on trading. The fifth chapter explores various barriers that the Pilot Team had to overcome before the trade could be finalized, and Chapter 6 provides insights into how best to address these barriers and effectively promote trading in future efforts. The final chapter, Chapter 7, addresses the transferability of trading to other POTWs, and the components a POTW must have in place in order for trading to occur.

The appendices to this report provide materials used by the Pilot Team in designing and implementing this project — PVSC's Rules and Regulations pertaining to trading, calculating effluent trading quantities, guidance on developing a trading agreement, the introduction letter sent to permittees, and questions and answers regarding effluent trading. Also included is a comparison between effluent trading and the SO<sub>2</sub> trading program and a glossary of effluent trading terms.

## **HISTORY OF PVSC'S LOCAL LIMITS AND IMPLEMENTATION OF EFFLUENT TRADING**

## **CHAPTER 2**

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POTWs are required to examine their operations in order to determine if local limits are needed to protect against pass through, interference, and treatment plant upset. When PVSC decided that it would beneficially reuse its biosolids (commonly referred to as sewage sludge), the agency began the work necessary to adopt local limits that would allow it to achieve that goal by June 30, 1997.

PVSC hired a consultant in 1992 to conduct the necessary study so that the limits could be adopted by 1994. At that time, the PVSC biosolids contained high levels of cadmium, copper, lead, molybdenum and zinc, which required additional pretreatment. The levels of four other metals — arsenic, chromium, mercury and nickel — were not of concern due to their low levels.

At PVSC, the effluent trading concept arose during the process of developing these local limits. Trading was initially intended to address a specific, and seemingly unique, problem with a large leather tanner in the PVSC district. This facility had previously installed a pretreatment system that met the 1985 compliance date for the federal categorical limits for chromium. In fact, by using this system it was able to consistently produce effluent with a chromium concentration half the 8 mg/l federal limit for the tanning industry.

The first draft of the local pretreatment limits included a chromium limit of about 3 mg/l, which was below the effluent concentration emanating from the tanner. If this had become the final limit for chromium, the company would not have been able to meet it without extensive and costly renovations to its existing pretreatment equipment. PVSC was very reluctant to require the company to further reduce its chromium levels for two reasons: 1) the leather tanner had already installed pretreatment equipment that decreased the chromium concentration in its wastewater discharge to levels well below the applicable federal categorical limit; and 2) the total amount of chromium contained in the wastewater flowing into the PVSC treatment plant could have been increased by a factor of three and PVSC would still have been able to meet the chromium limit for beneficial reuse of its biosolids.

At one of the Pretreatment Advisory Committee meetings, a representative of the tanner, who was a member of the Committee, asked if PVSC could develop an approach that would allow some flexibility in establishing the facility's local limit. PVSC agreed to examine the issue and concluded that effluent trading could allow flexibility in setting a local limit for a facility as long as the revised limit did not exceed the federal categorical limit.

The trading concept was included in PVSC's local pretreatment limits rule, but it was only after the rule became effective in 1994 that PVSC recognized this concept had a much wider application. It is important to note that several circumstances in the PVSC case made the decision to include effluent trading in the rule easier. First, chromium levels in PVSC's biosolids were already very low. Second, the company in question was in compliance with a federal categorical limit. Third, the company needed only a small incremental increase in its limit.

Through its innovative local limit development process, PVSC established two classes of metal dischargers. All dischargers must meet the local limits, but those that discharge a metal at or below a threshold value (set at background levels, which are slightly above the method detection limit) qualify for a non-use certification. (Exhibit 2-1 presents the threshold values and the local limits for the metals regulated by PVSC.) Companies that qualify under the new class of discharger are required to sample their effluent only twice a year to show they remain under the threshold. As part of this process, PVSC recalculated its local limits using a smaller regulated volume for each metal, excluding the volume for companies qualifying for non-use certification.

This change in the structure of PVSC's limits resulted in a final local limit for chromium of 5.36 mg/l, which happened to be higher than the concentration discharged by the tanner. Thus, after providing the impetus to develop an effluent-trading concept, the company responsible no longer needed to trade.<sup>1</sup> In fact, PVSC has recently withdrawn its local limit for chromium due to the rescission of EPA's chromium biosolids limit based on the outcome of a legal challenge.

The Pilot Team's ability to facilitate a trade was greatly enhanced because PVSC had already established trading as an accepted approach to meeting local pretreatment limits. The importance of incorporating trading into a POTW's regulations is emphasized further throughout this report.

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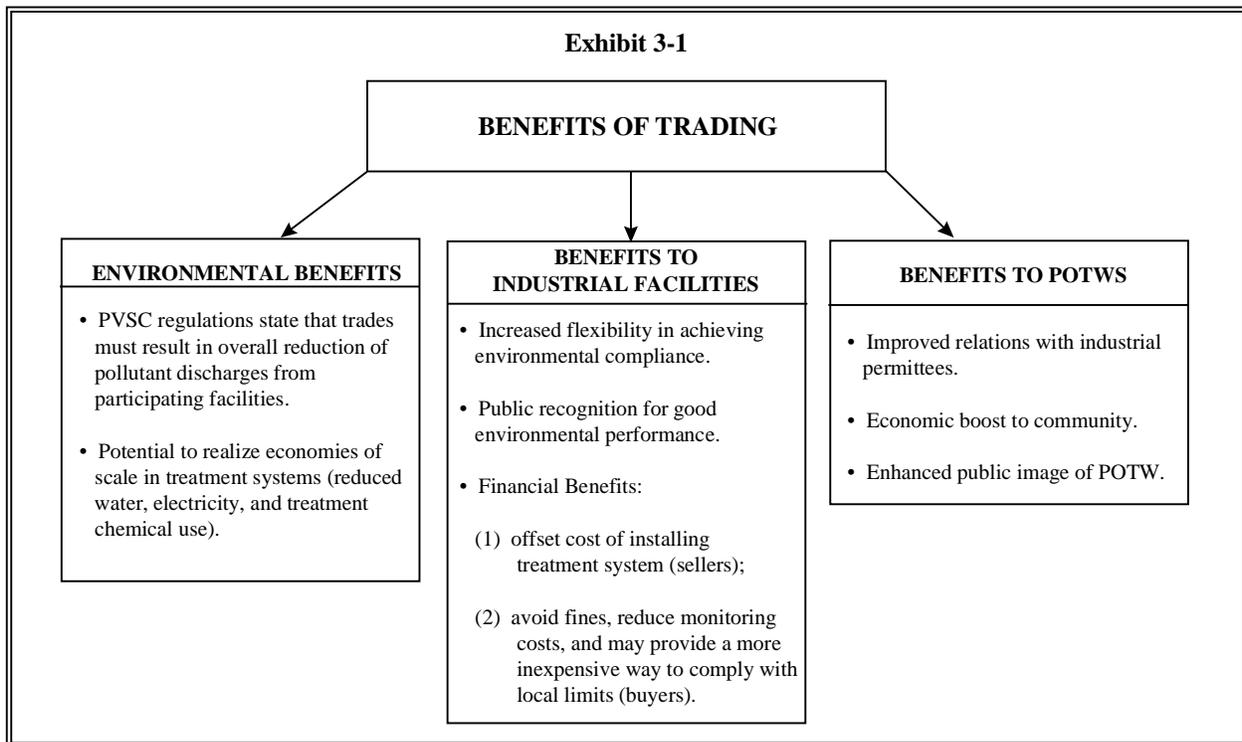
<sup>1</sup> The impetus for PVSC to establish effluent trading could have come from the local limit for any metal. The role of the chromium limit was simply a function of the specific concerns of a single large tanning company.

**Exhibit 2-1**

**THE LOCAL LIMITS AND THRESHOLD VALUES OF  
METALS REGULATED BY PVSC**

<b>Name of Metal</b>	<b>Monthly Average Limit (mg/l)</b>	<b>Threshold Value (mg/l)</b>
Arsenic (As)	0.15	--
Cadmium (Cd)	0.19	0.005
Chromium (Cr)	Suspended as of 11/9/95	Suspended as of 11/9/95
Copper (Cu)	3.02	0.092
Lead (Pb)	0.54	0.029
Mercury (Hg)	0.080	0.001
Molybdenum (Mo)	Suspended	Suspended
Nickel (Ni)	5.9	0.02
Zinc (Zn)	1.67	--

Trading of local pretreatment limits between indirect dischargers within a sewer service district is beneficial to the environment, industrial facilities, and the POTW. The specific rules and regulations governing trading in the PVSC service district are beneficial to the environment because they require trades to incorporate an overall reduction in the discharge of chemicals from participating facilities. Trading also benefits the environment by encouraging wider compliance with local limits among facilities, and reducing incentives for facilities to locate in areas with less stringent limits, thereby encouraging real reductions in loadings. The greater flexibility in meeting local limits afforded by trading also can lead to economic savings for industrial facilities that buy and sell effluent credits and help sustain local economic conditions. In addition, trading improves the effectiveness of POTWs as regulators by providing increased opportunities for facilities to comply with local limits. These benefits of trading are summarized in Exhibit 3-1 and described in greater detail throughout the chapter.



## **Environmental Benefits**

PVSC's trading regulations have a requirement that 20 percent of the effluent credits sold in a trade must be reserved, or "banked." Thus, there is a built-in mechanism for reducing the total quantity of pollutants discharged by facilities that trade. For example, if one facility agrees to sell 2.5 lbs./day of copper effluent credits, the buyer(s) can use only 80 percent of this amount or 2.0 lbs./day. The remaining 0.5 lbs./day of copper effluent credits must be banked.

Some critics of effluent trading argue that it does not truly reduce discharges of industrial pollutants even if there is a requirement to bank 20 percent of the traded effluent credits. For example, if a facility that has already installed pretreatment equipment to meet the limits and is currently discharging substantially below the limit is allowed to trade its excess reductions with a facility that is currently above the limit, the total permitted discharges from these two facilities would be higher than if the second facility were required to meet the limit through pretreatment or pollution prevention measures. However, without the trade, the first company is free to increase its pollutant loadings up to the limit at any time. Such an increase may occur as control technology equipment ages and perhaps becomes less effective, or as a facility changes or expands its operations. Under a trading agreement, though, this facility (the seller) is locked into a lower pollutant discharge level based on the quantity traded. The trade will provide an incentive for a facility to maintain the effectiveness of its control equipment or, in the case of expanding operations, to incorporate pollution prevention or additional control measures to stay within this lower discharge limit. Thus, the 20 percent of the allotment banked is a secured reduction.

In addition to the 20 percent reduction in pollutant loadings, a trading program may also allow companies to realize economies of scale associated with installing larger treatment systems at a single facility rather than smaller ones at two or more facilities. These economies of scale can have a positive effect on the environment. Companies may reduce their use of treatment chemicals, as well as the generation of hazardous waste from their use. They also may reduce their use of electricity and water.

Finally, trading encourages facilities to find creative and cooperative solutions to environmental compliance as an alternative to "local limits shopping" — the practice of locating a facility in an area with less stringent local pretreatment limits. In this way, trading can lead to real reductions in loadings rather than a redistribution of loadings across jurisdictional boundaries.

## **Benefits to Industrial Facilities**

Under conventional approaches to meeting local limits, each facility within a POTW service district must install additional pretreatment equipment or institute pollution prevention measures to achieve compliance with any new local pretreatment limits. Pretreatment trading is intended to provide facilities added flexibility in meeting these local limits, which can lead to greater economic efficiency and cost savings. In addition to direct economic benefits, facilities can benefit from increased public recognition associated with a good environmental compliance record. As described below, these benefits apply to both the sellers and buyers of effluent credits.

## **Sellers**

The primary benefit for a facility to sell effluent credits is financial. Selling excess reductions can help a facility recover some of the costs associated with the installation and operation of environmental controls or pollution prevention measures. The extent and nature of the financial benefits depends on the specific circumstances of how a facility achieves the excess reductions.

Under one scenario, a facility can achieve excess reductions by intentionally designing its pretreatment system with excess capacity to allow for future increases in production levels. If a facility does not actually increase its production for some period of time, it may have excess reductions to sell. In this case, entering into a trading agreement until it needs the full treatment capacity would allow a facility to recoup some of the additional cost associated with the greater degree of treatment.

A facility also may achieve excess reductions unintentionally through its effort to design and operate a system to meet the local limits with an ample cushion to allow for operational fluctuations. For example, a facility may over-engineer a treatment system in an effort to account for uncertainty over how well the system will perform. Some of this serendipitous excess could be sold to help offset the capital investment or operating costs associated with upgrading the pretreatment system.

Alternatively, the potential for trading excess reductions could serve as an incentive for a facility to explore and ultimately implement creative approaches to pretreatment that can achieve greater reductions. Similar to the two previous scenarios, the seller who institutes control measures and achieves excess reductions beyond those required to meet the local limits can recover a portion of its treatment costs by selling some or most of these reductions. To the extent that the price obtained for the excess reductions exceeds the incremental costs of achieving them, the seller gains financially.

## **Buyers**

There are many benefits of trading for the buyer of metal credits. Below, we highlight a few.

By increasing its level of compliance with local limits, the buyer benefits from avoiding fines and reducing monitoring costs. The reduction in monitoring costs results from the need to collect and analyze fewer effluent monitoring samples. PVSC permittees are generally required to monitor their discharge on a monthly basis. Typically, a facility samples its discharge early in the month. If the sample meets the local limits, no additional sampling is necessary for the remainder of the month. But if the initial sample exceeds the local limits, the facility needs to take additional samples to determine if the monthly average discharge levels meet the local limits. Thus, purchasing additional effluent credits as a "cushion" can reduce the number of monitoring samples taken by a facility. In addition to these direct cost savings, the facility will benefit from the public recognition for improved compliance.

Like sellers, the primary benefit of trading for buyers is financial. Buying excess reductions from another facility can provide a more cost-effective means of meeting local limits. The presumption is that a facility will choose to purchase credits when it can obtain them at a price less than the cost of developing and installing its own pretreatment upgrade. This may be particularly true if a facility is close to meeting the local limits, but has occasional exceedances due to fluctuations in its processes or production levels. The incremental cost of reducing its discharge or restricting its production to meet the local limits may be greater than the cost of purchasing a "cushion" that will allow it to operate comfortably within the local limits.

### **Cooperative Pretreatment**

When facilities are able to negotiate a trade prior to installing pretreatment equipment measures, they may be able to achieve even greater financial savings. This can occur because facilities will be able to evaluate both what control measures should be used and at which of the trading facilities they should be installed. This will allow them to choose the most economical control strategy.

### **Benefits to POTWs**

Effluent trading benefits POTWs and the community at large in several ways. First, allowing trading as an approach to meeting local limits can improve relations between a POTW and its industrial permittees (IPs). POTWs demonstrate increased willingness to work with IPs in developing more economical approaches to meeting local limits, and the process of establishing and negotiating viable trades introduces an element of cooperation into the relationship between POTWs and IPs, which can lead to reduced litigation and legal expense for both parties.

Second, trading can provide an economic boost for a community by alleviating constraints that POTW local limits may impose on operations at existing or new facilities. This may be especially true when a POTW needs to revise local limits due to a changing industrial base or to meet more stringent criteria. An existing IP may have already made substantial expenditures to meet federal or current local limits and be unable to afford the additional cost of complying with the revised local limits (e.g., installing additional pretreatment equipment, etc.) and remain competitive. Similarly, a new IP may not be able to afford the level of pretreatment needed to meet the local limits. In either of these cases, the reduced compliance costs associated with trading could help to increase or maintain the economic base of the community. Thus, it may be beneficial to the community for the POTW to incorporate effluent trading into its regulations.

Third, effluent trading also enhances the public image of a POTW as a proactive and effective regulatory agency. Through incorporating trading into its local regulations, a POTW shows that it is concerned with ensuring that facilities meet local limits that are protective of the environment, while alleviating any potential negative impacts of regulations on the local economy by allowing them to pursue innovative compliance approaches.

As evidenced by the strong support this pilot received from the stakeholder group for the New Jersey Chemical Industry Project, effluent trading can provide a more efficient way to protect the environment, an outcome that benefits everyone.

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In this chapter, general background information on trading is presented with a focus on the necessary components of a successful trading program to meet local pretreatment limits such as the one developed in this project. These components include adopting POTW regulations to allow trading, the requirements for being a buyer and a seller, and improving the environment. The chapter also outlines several key steps in developing trades, including calculating the trading quantities, the elements of a trading agreement, and trading negotiations and pricing. This chapter concludes with a discussion of the timing for developing a trading program relative to instituting new or revising existing local limits, and the importance of the POTW's compliance and enforcement record in establishing an effective trading program. Since this is apparently the first trade completed between facilities in a POTW service area, it is hoped that the experience gained through this effort will help guide others in developing and implementing successful trading programs.

### **Background on Trading**

This project focuses on trading local limits between facilities that are indirect dischargers. Yet trading can also occur between facilities that discharge directly into a body of water (direct dischargers). Direct dischargers (point sources) can also trade with non-point sources, such as farms. Usually the same pollutant must be traded and among direct dischargers, nutrients are the most commonly traded class of pollutants. For the PVSC local limits, metals were traded, copper for copper, zinc for zinc, etc.

Trading of local limits is allowed by EPA and encouraged as a way to meet local pollutant limits. Trading of Federal (categorical) limits is prohibited, however. These Federal limits are technology-based pretreatment standards and are applicable to specific industry groups. Many POTWs impose additional local pretreatment limits. These limits serve a variety of purposes, including protecting the quality of specific bodies of water, preserving the integrity of the POTW's treatment system, and improving or maintaining biosolids quality. For more information on trading, see the *Draft Framework for Watershed-Based Trading*,<sup>1</sup> or visit EPA's Office of Water trading web site.<sup>2</sup>

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<sup>1</sup> US EPA, Office of Water (4102), EPA 800-R-96-001, May 1996.

<sup>2</sup> <http://www.epa.gov/docs/owow/watershed/trading>

## **Components of a Trading Program**

### **Local Limits**

The cornerstone of effluent trading of local pretreatment limits is defensible local limits, developed on a sound technical basis. Solid data on current pollutant levels in biosolids and local receiving water bodies, pollutant loadings, fate and transport, as well as target levels for achieving goals for both ambient water quality and biosolids reuse are necessary for calculating defensible local limits. Details on setting local limits can be found in Chapter 7 of this report, *Transferability of Trading to Other POTWs*.

### **POTW Regulations**

When local limits are developed, the regulations issued by the POTW should include a specific allowance and encouragement for facilities to consider the use of effluent trading as a means of meeting the upcoming local pretreatment requirements. PVSC did this in Section B-104 of its Rules and Regulations (see Appendix A). The PVSC rules state:

- trading is a permissible way to meet local limits of heavy metals;
- the buyer and seller must submit documentation of an acceptable trade to PVSC for approval; and
- the trade must meet certain conditions, including:
  - the minimum amount that can be purchased or sold;
  - the minimum increment that can be purchased or sold;
  - only 80% of amount purchased can be used;
  - a buyer can purchase credits for a single metal from only one seller, but can purchase different metals from different sellers;
  - a seller can sell surplus reductions of a metal to multiple purchasers (up to ten); and
  - the amounts traded must be converted to average concentration values for the traders' permit limits.

The general permit provisions of PVSC's rules also provide procedures to address situations where a trade fails or is canceled. If a facility buys credits from a company, and the company goes out of business unexpectedly, the buying facility would lose the purchased credits. PVSC rules and regulations would allow the buyer a reasonable time to come into compliance. This would apply also if the seller were to discontinue the production process from which the metal reductions came.

During this pilot project, PVSC revised its regulations to meet the needs of some smaller businesses by decreasing the minimum amount and increment that can be purchased or sold and increasing the number of purchasers with which a seller can trade.<sup>3</sup>

POTWs may want to consider issuing regulations that allow pretreatment trading even if they do not believe that trading is in demand in their service area at the current time. Industrial facilities and government agencies sometimes differ on the importance they place on various factors that affect decisions relating to trading. This can lead to different opinions of the attractiveness or feasibility of specific approaches to controlling pollution. Issuing regulations now to allow trading to occur within a POTW service area will streamline the process should trading become a desirable compliance tool for the POTW's IPs. This will allow facilities to meet local pretreatment requirements more efficiently.

## **Environmental Improvement**

PVSC's regulations stipulate that a buyer can use only 80 percent of the metals purchased. This banking of credits not only provides for an immediate benefit to the environment, but also provides an additional measure of assurance that trading will not cause increased pollutant discharges.<sup>4</sup> An explanation of this concept is provided in Chapter 3, *The Benefits of Trading*.

Trading could be a way for facilities to come into compliance with new local limits more quickly through buying effluent credits, leading to more timely environmental protection. The possibility of trading could also motivate facilities that wish to be sellers to take more effective metals reduction measures. Increased rates of trading will lead to increased banking of metal credits and improved environmental conditions.

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<sup>3</sup> PVSC's rules adopted on September 30, 1994 set the minimum amount that could be traded at 1.0 pounds per day, the minimum increment was 0.5 pounds per day, and a seller could sell credits for a particular metal to as many as five buyers ("user sites"). On July 18, 1997, PVSC revised these amounts to a 0.1 pound per day minimum amount, 0.05 pound per day minimum increment, and a seller could sell credits for a particular metal to as many as ten buyers.

<sup>4</sup> This reduction of traded pollutant loadings represents an added environmental benefit of the PVSC trading regulations. It is not required, however, and POTWs should apply these extra reductions carefully to avoid constraining opportunities for trades. (*Draft Framework for Watershed-Based Trading, EPA 800-R-96-001, May 1996, pp. 6-10*)

## **Sellers**

A seller of metal(s) credits in this effort is a facility that has had levels of one or more metals in its discharge that were formerly above those allowed by the applicable new PVSC local limits and has instituted control measures that have brought its levels down below these limits to achieve reductions greater than needed to comply with the new requirements. The reduction may have come from installation of end-of-pipe control equipment, but not from discontinuing the process that produced the metals discharge. In addition, the use of pollution prevention that leads to reductions in metals discharges can also qualify a facility to be a seller. Thus, in order to be a qualified seller, the selling facility must have taken some positive action to reduce the metal(s) in its effluent. This reduction must have been instituted since September 1994, the date when PVSC passed its new local pretreatment rule, and must be documented.

## **Buyers**

A buyer is a facility that has metal(s) discharges that may exceed the new local limits, and would like to meet its new requirements by purchasing a seller's excess reductions of that metal.

## **Process of Developing a Trade**

### **Identifying Trading Partners**

The Pilot Team conducted an outreach effort to ask facilities if they were interested in participating in the pilot. PVSC then helped each interested facility evaluate its qualifications for trading. Since that time, PVSC has worked to update its capabilities to process and retrieve analytical data on discharges by its Industrial Permittees (IPs) and thus can now more easily identify qualified trading partners. Other POTWs with either fewer IPs — and a knowledge of each IP's processes — or the ability to process and retrieve detailed data on discharges by its IPs may be able to identify qualified trading partners more readily and contact these IPs directly to determine their interest in trading. Absent this information, an outreach campaign like the one used in this pilot can be employed. Refer to Chapter 6, *Approaches for Promoting Trading within a POTW Service Area*, for further discussion.

### **Calculating Trading Quantities**

As potential trading partners are considering how much of a credit to purchase or sell, they should consider how their current or planned production levels will affect compliance with the local limits, and how much of a "cushion" they will need. They should consider their ability to lower their pollutant discharge levels themselves through pollution prevention or simple and inexpensive technological improvements, the stability of their processes and possibility of an upset, changing market conditions and production levels, and the requirement that part of the purchased pollutant credit would be banked. Both buyers and sellers need to consider their own business needs when calculating the amounts to be traded so that they can comfortably operate within their adjusted permit limits.

Because PVSC local limits (and permit requirements) are expressed as concentrations and the metals credits traded are in pounds per day, it is necessary to convert from the effluent concentrations and volume of the seller to determine the quantity of each metal that can be sold. A buyer also needs to convert from the pounds per day of each metal purchased (minus 20 percent) back to a concentration level based on its discharge volume. To facilitate this step in developing trades, the Pilot Team provided each prospective trading partner with a series of sample calculations. These sample calculations are provided in Appendix B.

## **Trading Negotiations**

In developing a trading agreement, traders must negotiate in good faith. Yet it is quite possible for potential trading partners to approach negotiations with different assumptions on the type (and cost) of treatment that is appropriate, what costs should be shared, timing of the trade, and price. During the trading negotiations, the trading partners in this pilot discovered that they had little information to guide their negotiations. Because this type of trade had apparently never been done before in the United States, there was no precedent for various aspects of the agreement, including pricing, timing, and renewal terms. In addition, fewer than twenty potential trading partners had expressed an interest in trading and this included only two potential sellers. This meant that the market for metal(s) credits within the PVSC service area was small and poorly defined, and the trading partners had to think through the ramifications of each option and determine how to address the issues on their own.

The trading partners in this pilot worked together to identify each other's assumptions about the components of their agreement. Of particular importance were the issues that affected price. One issue was whether the buyer should share in the research and development costs, especially since this trade was negotiated and completed after the seller had researched and installed state-of-the-art equipment and the buyer had no involvement in choosing the equipment and evaluating whether it was possible to find a less-costly option. In retrospect, it is recommended that trading partners begin discussions very early in the process of preparing to meet new local limits, so that they have the opportunity to work together to develop the most cost-effective methods. For more information, see the "Timing" section below.

The Pilot Team agreed that it was not the role of regulatory agencies to influence price and that the price could range from the marginal cost to the seller of further reducing its metals discharge to the cost the buyer would need to incur to reduce its discharge levels to comply with the new limits. Yet, beyond that, the trading partners realized that there were a number of ways one could think about trading and the resulting "appropriate" price could vary considerably. If the seller has already installed pretreatment measures, the income from selling the extra reductions could be considered a windfall gain (minus transaction costs of negotiations and legal fees). Buyers used this perspective to argue that the price should be fairly low. By purchasing metal(s) credits, the buyer, however, would be avoiding the cost (and risk) of installing and maintaining equipment (or other metals reduction measures) and minimize the possibility of exceeding the pretreatment limit. Thus, the sellers saw the value of purchased metal(s) credits to buyers as quite high, implying that the price should be high. It was also noted that the transaction could be viewed as a cost-sharing arrangement, assuming the selling price per metals credit would be close to the total cost of researching and

installing new equipment divided by the number of credits "produced." This approach could still lead to differences over the "appropriate" price if the parties had differing views of appropriate technology and the associated costs differed significantly.

## Trading Agreements

Trading agreements are legally binding contracts between trading partners. The Pilot Team provided guidance to the potential trading partners to help them prepare trading agreements. This guidance noted that each agreement should contain the amounts to be traded (considering the 20 percent banking and their "worst case" operating conditions), the price and terms of payment, the time frame of the agreement, timing of renewals and adjustments, provisions for either party to end the agreement, and enough information on how each party would fulfill its obligations so that PVSC could evaluate the environmental credibility of the agreement. This guidance is presented in Appendix C. The specific elements of the trading agreement signed under this pilot project are outlined in Exhibit 4-1.

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### Specific Elements of the Trading Agreement

- **Standard Contractual Information**
    - Date
    - Names and addresses of parties
    - Assignability
    - Jurisdiction
    - Signature
  - **Statements Specific to Trading**
    - Seller has taken positive treatment or pollution prevention measures to reduce pollutant effluent loadings
    - Seller and buyer are complying with other POTW requirements
    - Intent to trade
  - **Details of the Trade**
    - Type and amount of metal traded
    - Effective dates of trade
    - New calculated permit limits (accounting for the amount traded and 20 percent baseline)
    - Consideration to be paid and terms of payment
    - Procedure for terminating the contract (if needed)
- 

## Approving the Trade

Once the trading partners have negotiated the trade and developed a trading agreement, the details of the trade set forth in this agreement should be reviewed by the POTW to ensure that the partners. Specifically, the POTW should confirm that the seller has implemented appropriate treatment or pollution prevention measures to reduce the amount of the traded pollutant in its effluent, both trading partners are in compliance with other POTW requirements and can reasonably comply with the terms of the agreement (i.e., the permit limits resulting from the trade). Once the POTW approves the trade, it adjusts the permit limits of the trading partners, lowering the limit for the seller by the amount of the trade and raising the limit for the buyer by the amount of the trade minus the 20 percent that is banked.<sup>5</sup>

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<sup>5</sup> Each of the trading partners is then responsible for meeting its own adjusted permit level. Thus, one partner would not be penalized if the other trading partner has a violation. If one partner consistently fails to meet the permit levels set under the trade, PVSC may adjust the trade agreement and the associated permit limits.

## **Other Elements of Trading**

### **Timing the Development of a Trading Program**

The Pilot Team concluded that it is most productive for the concept of trading to be introduced to the industrial user community at the same time new local limits are being developed or existing ones are being revised. That way trading partners can begin discussions early on in the process of planning how they will meet the new or revised limits. For example, it may be more economical to install additional treatment at one facility than at another, or certain types of treatment may be more economically feasible when trading is employed than when each facility institutes its own controls. Facilities may wish to explore the feasibility of joint ventures to evaluate and employ control measures. This early discussion would allow facilities to find the most economical ways of complying with their limits.

If a POTW has established trading in its regulations, the concept of trading could also be introduced during enforcement actions as an alternative to the facility installing more pretreatment. Trading may also allow a facility to come into compliance more quickly.

### **POTW Credibility**

A strong compliance and enforcement program is an important factor in successfully implementing effluent trading because it sends the message to industrial users that they will be held accountable for carrying out the terms of their trading agreements, and serves to assure the public that the POTW can be trusted to effectively administer the program. As such, it is critical that the POTW has accurate and complete data to support its compliance and enforcement efforts and to enhance the credibility of its established local pretreatment limits. The POTW should have good records of the flow and pollutant loadings of each industrial permittee, a regular inspection system with complete documentation, and a record of prompt and effective enforcement of violations.

This chapter discusses some of the organizational and social factors observed during the process of developing a trade in the PVSC service area. The Pilot Team believes that many of these factors are likely to affect other trades. Given the current organizational structures, roles, and practices among facilities and POTWs, and how these may change while using trading to reduce pollutant levels, it is important to understand these factors and their effect on trading local pretreatment limits to reduce uncertainties and develop a successful trading program.

Although trading has been allowed under PVSC's rules since September 1994, there were no substantive trading negotiations until more than two years later in February 1997 when the NJ Chemical Industry Project started to facilitate trading. The first trade occur in July 1997. This lack of trading activity can be largely attributed to the many uncertainties that posed barriers to trading. How could a company identify other potential trading partners? How would those companies react if another company, especially a competitor, asked to make a deal with them on reducing pollution through effluent trading? What would a trading agreement look like? What effect would trading have on company operations? If one of the trading partners had a process upset or went out of business, how would that affect the permit of the other partner?

### **Uncertainties of Trading**

Trading of local pretreatment limits was such a new concept to companies that they seemed quite puzzled about how it would work. This confusion went beyond the basic mechanics of trading.

- Many companies, especially small companies, have only enough resources to keep up with the minimum requirements from the various agencies they deal with. The relationships companies have with regulatory agencies are generally straightforward: find out what the requirements are and comply with those requirements or risk being fined or worse. They did not think they had the resources to learn about a new approach, which seemed foreign.

- Most companies never discuss their operations with other companies. The need to guard proprietary information and avoid any suspicion of collusion is a strong disincentive for cooperation. Could a company disclose the minimum information necessary to effect a trade without disclosing confidential business information?
- Some companies wondered if raising their profiles would attract increased scrutiny or criticism. How would the POTW react to companies involved in a trade? Would there be any increased inspections? How would environmental groups and the general public react to trading? Would they see trading as a benefit or a threat to environmental quality?
- Companies sophisticated enough to understand the trading approach still wondered how they could put the pieces together to implement a trade. Searching the POTW files to find suitable trading partners, approaching companies they did not know to educate them on trading and ask them to consider negotiating a trade, as well as figuring out all the attendant details, seemed insurmountable.
- What about timing? Facilities that could be sellers were already meeting the new limits while the potential buyers were "under the gun" to meet the new requirements. Would the timing of trading negotiations, just months before the compliance deadline for the new requirements, affect their ability to negotiate a fair agreement?

In addition, the regulatory agencies initially perceived their roles as developing and disseminating information about trading and its advantages (a role for EPA) and developing and promulgating rules to allow trading (a role for PVSCs). No agency saw hands-on facilitation of the trading process as its role. This added to the companies' perception that they would need to make a substantial effort if they wanted to trade, and they would have to do it alone.

These uncertainties, associated with every step toward effecting a trade, added to the perceived costs of trading.

### **Overcoming Uncertainties**

The NJ Chemical Industry Project's Effluent Trading Pilot was able to overcome these uncertainties and help facilities to successfully complete a trade. Working in partnership with PVSC, NJ DEP, and EPA Region 2, the EPA-sponsored pilot project facilitated the process of identifying potential trading partners and negotiating a trading agreement. The project manager sent a letter (see Appendix D) to each of the industrial dischargers in the PVSC service area, asking if

they would be interested in working with others to establish trading. Meanwhile, the Pilot Team worked out the details of what would be needed to help companies complete a trade. The interested companies were invited to a meeting where the group discussed:

- the process of developing a trade;
- what is and is not acceptable under PVSC rules;
- what to consider when developing a trading agreement;
- the review and approval process for trades;
- how the "banking" of effluent credits would work;
- how discharge permits would be changed to reflect trades; and
- how their permits would be affected by changes to a trading partner's status.

Many of these issues were addressed in a set of "questions and answers" developed by the Pilot Team (see Appendix E). After the meeting, each company was later sent a list with the names and phone numbers of all interested companies.

Still some barriers persisted. Many companies were unsure what the repercussions of trading would be. Some companies chose not to participate because they thought trading might provide a business advantage to their competitors. The minimum allowable amounts that could be traded were too high for many small companies. In response, PVSC reduced the minimum trading quantity and increment to allow smaller companies with less metals in their effluent to participate.

### **Price Negotiations**

As previously discussed in Chapter 4, negotiations over the price of the trade were complicated — each company had a different view of what was fair. Some companies called EPA asking for guidance on price. The Pilot Team agreed that it would be inappropriate for a regulatory agency to influence the price of a trade. EPA agreed to look into hiring a neutral mediator if that became necessary, but it did not — the partners reevaluated their accounting and were able to forge an agreement.

One factor that affected the price negotiations was assumptions about what costs the trading price should cover. One of the sellers had researched and installed state-of-the-art equipment to reduce pollutant levels in its effluent, and believed the price should cover part of that development cost. Buyers believed they should not pay development costs, especially since they had no say in what control technology was used. Furthermore, they felt that their incremental costs of meeting the local limits outright would be less than the seller's development costs. All of the trading partners

agreed that discussions about trading as a way to reduce pollutant levels should begin early – soon after local limits are found to be necessary – to allow them to develop the most cost-effective control approaches.<sup>1</sup>

### **Completing a Trade**

The approaching June 30, 1997 deadline for meeting the new local limits placed more pressure on the potential buyers than the seller. The seller was already meeting the new local limits. The buyers were above the new limits, or below the new limits but close enough that they desired a "cushion" to cover process fluctuations. The buyers still had to find a way to ensure that they would be able to meet the new local limits by the June 30 compliance deadline.

In the end, two companies were able to negotiate an agreement. In describing the negotiations, the trading partners noted that they had known each other prior to initiating the tracking process and this was a great help in reaching an agreement. Once PVSC reviewed and approved the agreement, PVSC modified the discharge permits for each company, effective July 1, 1997. Some additional companies may find that trading can be used to allow a cushion for fluctuations in their processes and production levels. Trading may also be an attractive alternative for companies that find they cannot meet the new local limits by other means.

### **Improving the Climate for Trading**

Although the Pilot Team was successful in facilitating trading of local limits within the PVSC service area, it seems like only a small proportion of the companies that could meet their local limit requirements through trading actually considered doing so. Why are so few companies participating? How can we improve participation?

Are there actions that regulatory agencies can take to increase the number of facilities using effluent trading to meet local limits? Yes. For example, the Pilot Team can disseminate the lessons they learned from the Effluent Trading Pilot as is being done in this report and through articles and conferences. EPA can disseminate the lessons of this pilot to its Regional Pretreatment Coordinators and encourage them to take steps to increase the opportunity for trading in their Region, and can also encourage states and POTWs. States

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#### ***Is It Easier to Trade in Air?***

*It seems that trading has caught on much more for air SO<sub>2</sub> emissions trading than for water effluent trading. What are the differences between these programs? The most important difference seems to be the level of hands-on negotiations. See Appendix F for a comparison of some key differences between SO<sub>2</sub> trading and trading local pretreatment limits.*

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<sup>1</sup> For more information on the trade negotiations, please refer to Chapter 4, *Elements of a Successful Trading Program*.

can get the word out to POTWs. POTWs can write their rules to allow trading and then get the word out to their industrial users. As discussed above, many of the barriers to trading stem from uncertainties and fears of the implications of trading, not just the basic mechanics. Knowledge can help to reduce those fears.

Should additional "Effluent Trading Teams" be established in POTW service areas across the country to foster trading as the NJ Chemical Industry Project Pilot did? Maybe. That would be a decision to be made in each local area. Local trading teams would be most effective in promoting trading at times when new or revised local limits are being developed and implemented. Each team, consisting of members from the local POTW, the state, and industry, could set out a process and guidance for trading within the POTW service area. (See materials used in this pilot in Appendices B, C, D and E.) Teams also could get the word out to local industrial users to let them know trading is an option for meeting their local limits and how they can participate, and disseminate lists of potential trading partners. Once the basic procedures are set and the information is sent out, the teams' role would be to answer questions and facilitate solutions to any problems that arise.

While the basic mechanics of effluent trading are relatively simple, it is important to recognize that trading requires organizations to think differently and alter their well-established relationships. These organizations are made up of people, and changing the way people operate and relate to each other will take some time and effort. Yet it is possible to do so and achieve the benefits that change can provide.

In the course of designing and implementing the Effluent Trading pilot, it became clear that the facilities' lack of familiarity with the concept of effluent trading was a significant barrier to establishing a successful trading mechanism.

Thus, in the initial stages of the pilot, the team was faced with several issues related to encouraging the concept of trading, including:

- What would be the process of informing potential traders that trading is allowable within the current regulatory framework?
- How do we identify potential traders within a given sewer service district?
- How do we link potential buyers to sellers?

### **Outreach to Potential Traders**

The Pilot Team conducted extensive outreach to PVSC industrial permittees to address these issues and facilitate the trading process. This outreach included sending a letter inviting PVSC's industrial permittees (IPs) to participate in a pilot project on trading local limits — either as a potential trader or an advisor — and convening a meeting of 20 potential traders in February 1997 based on the response to this letter.<sup>1</sup> Following the meeting, the pilot team compiled and distributed a list of facilities that indicated some interest in trading. This list of potential traders included

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<sup>1</sup>The letter encouraged companies to participate in the pilot as advisors if they did not think of themselves as potential traders, but were simply interested in learning more about trading or in contributing their ideas on how to structure or encourage it.

information on how to contact the facilities and indicated each facility's interest in the project – i.e., buyer or seller, specific metal and amount needed to buy or available to sell. Potential traders utilized this information in initiating trading negotiations with other participating facilities.

The Pilot Team maintained contact with all potential traders to provide assistance in expediting any trading negotiations. In some instances, potential traders had additional questions about the trading requirements; these conversations served as a good forum for continued information exchange. The Pilot Team provided potential buyers with important information on the requirements of trading and sellers and, in turn, potential traders provided the pilot team with updates on any trading negotiations.

At present, a buyer and seller have signed a trading contract for the exchange of copper credits. In addition, the Pilot Team expects that other facilities may pursue trading as a compliance strategy once they evaluate how effective their pretreatment equipment is in meeting the local limits. Some facilities may find that trading can provide a needed cushion between their pollutant discharge level and the local limits that allows for routine fluctuations in their processes and production levels. Others may find that they have achieved excess reductions by installing pretreatment upgrades and may wish to recoup some of their capital investment or operating costs by selling credits to other facilities. Companies also may discover that there are economy-of-scale benefits in developing a cooperative approach to pretreatment.

Despite this success, Pilot Team members have expressed concern that perhaps additional outreach measures and an increased focus on small volume dischargers would have attracted additional PVSC industrial permittees to the concept of effluent trading. Some of the Pilot Team's thoughts on ways to more effectively promote trading in future efforts are outlined below.

### **Lack of Information on Trading Programs and Potential Traders**

The lack of information on trading programs is a significant barrier to facilities using effluent trading as an approach to meet their local discharge limits. In the case of the Effluent Trading Pilot, many PVSC permittees were unaware of existing PVSC regulations that allow trading. This was true despite the fact that PVSC had modified its regulations in 1994 to allow it, and had sent a copy of the modified rule and a fact sheet to each of its permittees. EPA's outreach letter to PVSC permittees served as an additional introduction to effluent trading for these facilities.

The Pilot Team has emphasized that additional outreach measures are needed to increase awareness of existing trading programs and assist in gathering data on potential traders. Appropriate types of outreach to potential traders may include mailings, press releases, and articles in trade journals. These types of outreach, when used in combination, may be more effective than the single outreach letter used in this pilot.

As part of an outreach program, it would be important to develop and distribute guidance on trading. These materials could include:

- A list of qualifications for buyers and sellers.
- A technical guide on trading explaining the regulations and how to calculate trading amounts.
- Common questions and answers about trading.

Lack of information about other potential traders is also a barrier to establishing trades. Potential traders have claimed that limited access to appropriate discharge monitoring data hinders their efforts to find partners. Although discharge monitoring data are available to the public, they are available only from the regulatory agencies (e.g., POTWs). Examining discharge monitoring data from a POTW is a time-intensive process, and potential traders regard this activity as a significant barrier to pursuing effluent trading options.

Presently, PVSC is in the process of developing a database that will include discharge monitoring data. This database may help facilities within this sewer district locate potential trading partners more easily, but not all POTWs or municipalities will have such extensive computerized records. One possible approach to improving the ability of facilities to find trading partners is to establish information clearinghouses that potential traders could contact to help identify potential trading partners within a particular sewer service area.

While increased access to monitoring data can help identify potential traders, these data are not always sufficient for this purpose. For example, these data can identify which facilities exceed a local limit and may be in need of purchasing effluent credits; however, the monitoring data for a facility that has already installed pretreatment or pollution prevention measures will show low pollutant discharges without providing any indication that the facility may be an eligible seller of effluent credits.

A possible solution to the limitations imposed by the nature of monitoring data involves the POTW playing a larger role in identifying potential sellers in one of two ways. First, POTW staff may be familiar with the compliance history of many of the facilities in the service district and, thus, have an initial indication of which ones have achieved excess reductions through the installation of pretreatment or pollution prevention measures and are potential sellers. Second, a POTW can actively promote the availability of trading and help buyers and sellers more readily identify themselves.

## **Small Volume Dischargers**

Small volume dischargers face additional barriers to establishing trading agreements. Small volume dischargers are often small companies that lack the resources to research and negotiate trades. Despite the Pilot Team's outreach efforts, only a few small volume dischargers actively pursued trading negotiations with a seller of metal credits. Small volume dischargers contacted as part of this pilot project expressed their interest in purchasing a small amount of metal credits (e.g., 0.1 pounds per day of copper). Some of these facilities have purchased new pollution control equipment that has not yet been proven to meet the new discharge limits. Therefore, purchasing a small amount of metal credits would provide these facilities with some cushion to ensure that they are in compliance. The need to purchase only a small amount of metal credits is also a result of their low effluent volumes - in some cases less than 5,000 gallons per day.

Small volume dischargers have also encountered some difficulty in pricing. It is difficult to obtain favorable pricing for small quantity trades because of the transaction costs.<sup>2</sup> Also, because price information remains proprietary, potential traders do not have ample guidance for price negotiations. While this is true for both large and small companies, it seems to be a larger concern for small companies.

A brokerage service or consortium approach may help overcome these barriers. A trading broker could offer services of locating potential trading partners and conduct price negotiations with potential trading parties. In a consortium approach, a seller of credits could form a comprehensive trading arrangement among a group of facilities within a sewer service district. These techniques could serve as an incentive for small volume dischargers to seriously pursue trading negotiations.

Another potential solution to barriers encountered by small volume dischargers is for the POTW to assume a more active role in brokering or promoting trades. POTW staff are aware of discharge monitoring information for all IPs within their sewer service district and understand the regulations pertinent to potential trades. Therefore, POTWs may be well positioned to encourage trading by facilitating efforts to search for trading partners. For example, when new limits are proposed, POTWs could distribute information on which IPs might be interested in trading. This information could also be distributed to facilities that apply for new hookups to the POTW as a means of introducing them to trading. In addition, the POTW could provide this information as part of its enforcement response to violations.

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<sup>2</sup> Possible transaction costs include management costs of negotiating a trade and the legal costs to prepare a contract.

Trading pretreatment limits within POTWs' service areas is a positive step toward developing common sense solutions to water quality problems. In the PVSC service area, an effluent trading pilot project offered a flexible means to implement and enforce local pretreatment limits. However, can trading programs be instituted at other POTWs? What groundwork must be established? What serves as the foundation for such a project?

Establishing an effluent trading program is not restricted to those agencies with an EPA- or State-approved industrial pretreatment program (considered delegated local agencies, or DLAs). POTWs not having an approved industrial pretreatment program may also establish a trading program. Many of these agencies, however, do not have a sufficient number of industrial permittees, nor do they have the personnel necessary to develop such a program. As a result, non-DLAs wishing to establish an effluent trading program should consult with their Approval Authority prior to instituting a trading program.

Although PVSC was a good candidate for the pilot project due to its diverse and large number of industrial permittees, there is no “magic number” of permittees a POTW should have in order to establish a trading program. Special circumstances, such as a shared need among permittees for similar treatment facilities, or complementary needs (e.g., Permittee A over-treats for copper but needs more zinc treatment, while Permittee B over-treats for zinc but needs more copper treatment) make trading appropriate for even a very small POTW. However, a program generally has a better chance to succeed if there are more industrial permittees — more permittees means more potential trading partners, both buyers and sellers. Any POTW interested in a trading program may find it worthwhile to first determine if the number and diversity of its industrial permittees would support a successful program. Even where there is no current need for trading, a POTW could establish the trading framework within its rules and regulations for possible future consideration.

The ability of POTWs to incorporate trading as part of their activities relies on many issues, including:

- having technically-sound, defensible local pretreatment limits;
- incorporating trading into its rules and regulations or sewer use ordinance;
- and

- having or establishing a strong pretreatment enforcement program.

Because trading only applies to local limits, developing technically-sound, defensible local limits is a core element in establishing an effluent trading program. With technically-sound limits, POTWs can more easily address questions regarding the appropriateness and/or adequacy of any existing local limits, the basis for limits, and whether limits ensure the POTW's compliance with its own operating permit criteria.

Under federal regulations at 40 CFR 403.8(f)(4), POTWs are required to develop local pretreatment limits or demonstrate that such limits are not necessary. They are also required to re-evaluate local limits once every five years in accordance with 40 CFR 122.21(j)(4). The local limits must protect the treatment plant from pass-through and interference, and must enable the treatment plant to comply with the remainder of its environmental criteria (e.g., biosolids quality, worker health and safety, quality of receiving waters, etc.).

When developing local limits, POTWs must determine their maximum allowable headworks loading (MAHL), and, subsequently, the maximum allowable industrial loading (MAIL). With this information, a POTW can utilize different allocation methods and can allow trading to occur, provided the MAIL is not exceeded. Disbursement of available MAIL has generally been achieved utilizing a uniform allocation methodology (i.e., the same concentration limit for all industrial permittees). These concentrations are then incorporated into the POTW's sewer use ordinances or rules and regulations and included, where appropriate, within the control mechanisms (i.e., permits) issued to the industrial permittees. It is important to note, however, that a trading program can be established regardless of whether the limits within the rules and regulations or sewer use ordinance are concentration-based or mass-based.

Another important factor in establishing an effluent trading program is the incorporation of proper legal authority into local agency rules and regulations or sewer use ordinances. At a minimum, the legal authority to establish a trading program must:

- enable a POTW to allow buying and selling among its permittees;
- require POTW review and approval of documentation relative to the transactions (excluding portions of the contracts that contain monetary information);
- allow POTWs to modify the discharge permits of participating parties; and
- detail the criteria of trading actions (minimum trading quantities and increments, usable quantities/banking, number of trading partners, etc.).

A modification to include this legal authority into the rules and regulations or sewer use ordinances may be considered a “substantial modification” under 40 CFR 403.18, and may require Approval Authority review.

While an effluent trading program allows a user to meet its required effluent limits without necessarily having to install pretreatment upgrades, a regulatory perspective must also be considered:

What happens if a facility is in noncompliance with its discharge limits? The answer lies in the development of a strong enforcement program to adequately deter noncompliance similar to what is in place without trading. A strong pretreatment enforcement program may result in both the delegated local agencies and the industrial permittees seeking alternative methods for achieving compliance. This may generate more interest in developing effluent trading programs.

While local limits, legal authority, and enforcement constitute major components of establishing a trading program, other factors must also be considered for those POTWs contemplating such a program. Some of these include:

- having the personnel/resources to initiate the permit modifications necessary to reflect the trade, including complying with the public notice requirements;
- determining the pollutants to be traded;
- determining the role of the local agency with respect to the trading activities (e.g., identifying potential trading partners, acting as brokers);
- understanding the industries and the types of discharges entering into the collection system; and
- being accountable to the Approval Authority to ensure proper implementation and enforcement of any modified limits.

POTWs have discretionary authority with respect to establishing an effluent trading program within their sewer service areas. Through the PVSC pilot, the necessary measures and factors to be considered when developing a trading program have been identified, and the stumbling blocks relative to moving the program from theory to implementation have been documented. As such, other POTWs wishing to establish a trading program will greatly benefit from the lessons learned from this pilot.



# NEW JERSEY CHEMICAL INDUSTRY PROJECT

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## Appendix A

### RULES AND REGULATIONS CONCERNING DISCHARGES TO THE PASSAIC VALLEY SEWERAGE COMMISSIONS TREATMENT WORKS<sup>1</sup>

#### **Section B-104 Emission Trading**

- B-104.1** Subject to the restrictions defined in subsections B104.2 and B104.3, PVSC may permit users to sell or purchase quantities of heavy metals regulated by the Local Limits. Emission trading shall not be approved if it results in a user exceeding a categorical limit. The objective of emission trading is to minimize unnecessary pretreatment and thus reduce the generation of hazardous waste, but on a very limited basis.
- B-104.2** A request to participate in emission trading shall be submitted by both the buyer and the seller. Both users shall submit documentation acceptable to PVSC that both parties agree to abide by the regulations contained in this Section. PVSC will review the request and at its discretion, will approve or deny the request. A request for emission trading shall not be permitted to avoid enforcement, but may be included in actions to achieve compliance.
- B-104.3** In order for a request to be considered, it must meet all of the following criteria which apply:
- a. Minimum purchase or sale - 0.1 lbs. per day.
  - b. Minimum increment purchase or sale - 0.05 lbs. per day.
  - c. Usable quantity - purchaser shall use only 80% of purchased quantity, the balance being reserved for future needs.
  - d. A buyer may purchase more than one heavy metal, but shall purchase the entire quantity of a particular heavy metal from only one seller.
  - e. A seller shall not sell the same heavy metal to more than ten user sites.
  - f. A buyer may purchase different heavy metals from different sellers.
- The quantities traded shall be converted to average concentration values using the average annual discharge volume from that outlet affected by the trade. PVSC reserves the right to adjust the concentration value based upon its analyses of changes in regulated flow volume.

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<sup>1</sup>Source: Appendix B: Pretreatment Limitation #1 Local Limits from the "Rules and Regulations Concerning Discharges to the Passaic Valley Sewerage Commissions Treatment Works."



## Appendix B

### HOW TO CALCULATE EFFLUENT TRADING QUANTITIES FOR PVSC LOCAL LIMITS

#### I. Information that you need to know about your facility:

- A. PVSC local limit -- for example, the effluent limit for copper is: 3.02 mg/L
- B. Current copper concentration in effluent: mg/L
- C. Current volume of effluent: MGD [millions of gallons per day]

*Note: You may want to consider worst case scenarios for volume and concentration to ensure that your post trading effluent limit allows for the variability of your operations.*

#### II. For Buyers: Steps for calculating how much copper you need to purchase:

- 1. Calculate the difference between the local copper limit and your facility's current copper discharge concentration to determine the needed increase in the effluent limit (on a concentration basis).<sup>1</sup>

For example: if a chemical facility currently operates at a 5.20 mg/L copper discharge concentration, the additional allotment needed would be:

$$5.20 \text{ mg/L} - 3.02 \text{ mg/L} = 2.18 \text{ mg/L}$$

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<sup>1</sup>A company has flexibility to trade as long as its discharge effluent concentration remains below the federal categorical limit (see 40 CFR Chapter I subchapter N). According to 40 CFR Chapter I subchapter N part 413, electroplaters discharging  $\geq 38,000$  L/day (~ 10,000 gal/day) can discharge copper at a maximum concentration of 4.5 mg/l. For example, an electroplater with an effluent stream of 0.15 MGD can discharge a maximum of 6.07 lb/day of copper.

Under 40 CFR Chapter I subchapter N part 414 subpart K, Organic Chemicals, Plastics and Synthetic Fibers (OCPSF) — facilities are not held to any categorical standards for copper, but must adhere to categorical standards for lead and zinc.

2. Convert the additional needed allotment from concentration basis (mg/L) to mass basis (lb/day) using the following equation:

$$\text{concentration (mg/L)} * \text{volume (MGD)} * 8.344 \text{ (factor)} = \text{mass (lb/day)}$$

For example: if your facility's average annual effluent discharge rate is 150,000 gal/day (or 0.150 MGD), the additional allotment needed on a mass basis would be:

$$\mathbf{2.18 \text{ mg/L} * 0.150 \text{ MGD} * 8.344 = 2.73 \text{ lb/day}}$$

3. In calculating how much copper allotment to purchase, you need to account for "banking" 20 percent of the purchased amount.

$$\mathbf{2.73 \text{ lb/day} \div 0.80 = 3.41 \text{ lb/day}}$$

4. According to the proposed changes to PVSC's regulations, buyers must purchase metal credits at a minimum amount of 0.10 lb/day and at minimum increments of 0.05 lb/day. Therefore, the amount your facility needs to purchase would be:

$$\mathbf{3.45 \text{ lb/day}}$$

### **III. For Sellers: Steps for calculating post trade adjusted concentration limit**

1. Calculate the actual permitted quantity that your facility can discharge based on the local limit and your facility's discharge volume as follows:

$$\text{local limit (mg/L)} * \text{volume (MGD)} * 8.344 \text{ (factor)} = \text{allowable discharge (lb/day)}$$

For example: if your facility has an average annual discharge rate of 200,000 gal/day (or 0.20 MGD), the amount of copper it can discharge and still be in compliance is:

$$\mathbf{3.02 \text{ mg/L} * 0.20 \text{ (MGD)} * 8.344 \text{ (Factor)} = 5.04 \text{ (lb/day)}}$$

- Assuming that your facility sells 3.45 lb/day to the buyer in the example above, its adjusted discharge limit after the trade would be:

$$5.04 \text{ lb/day} - 3.45 \text{ lb/day} = 1.59 \text{ lb/day}$$

- Convert this mass based limit to a concentration based limit as follows:

$$\frac{\text{mass limit (lb/day)}}{\text{volume (MGD)} * 8.344 \text{ (factor)}} = \text{concentration limit (mg/L)}$$

For example: if, as in step 1 above, your facility has an average discharge rate of 200,000 gal/day (or 0.20 MGD) the adjusted discharge limit (on a concentration basis) after the trade would be:

$$\frac{1.59 \text{ (lb/day)}}{0.20 \text{ (MGD)} * 8.344 \text{ (factor)}} = 0.95 \text{ mg/L}$$

#### IV. Additional calculation example for buyers needing to purchase a small amount of metal credits

*(NOTE: Please refer to steps 1 to 4 of Part II of this document for specific instructions for calculating the amount of metal credits to purchase.)*

##### Facility Scenario:

PVSC Local Limit for Copper = 3.02 mg/l

Current Copper Discharge Concentration = 3.07 mg/l

Average Annual Effluent Discharge Rate = 150,000 gal/day or 0.150 MGD

- Difference between local copper limit and your facility's current copper discharge concentration:

$$3.07 \text{ mg/l} - 3.02 \text{ mg/l} = 0.05 \text{ mg/l}$$

2. Convert additional needed copper allotment from concentration basis (mg/l) to mass basis (lb/day).

$$0.05 \text{ mg/l} * 0.150 \text{ MGD} * 8.344 = 0.06 \text{ lb/day}$$

3. Account for banking 20 percent of the needed copper allotment.

$$0.06 \text{ lb/day} \div 0.80 = 0.08 \text{ lb/day}$$

4. Account for regulatory requirement to purchase minimum amount of 0.10 lb/day at minimum increments of 0.05 lb/day. Therefore, the amount of copper needed for your facility to purchase is:

$$0.10 \text{ lb/day}$$

**V. Additional calculation example for a facility selling small allotments to 6 facilities with a large allotment to one facility**

**Buyers' Information:**

Amount of copper purchased by Small Buyer 1:	0.15 lb/day
Amount of copper purchased by Small Buyer 2:	0.20 lb/day
Amount of copper purchased by Small Buyer 3:	0.10 lb/day
Amount of copper purchased by Small Buyer 4:	0.10 lb/day
Amount of copper purchased by Small Buyer 5:	0.10 lb/day
Amount of copper purchased by Small Buyer 6:	0.10 lb/day
<u>Amount of copper purchased by Large Buyer:</u>	<u>3.45 lb/day</u>
Total Copper sold by Seller:	4.20 lb/day

**Seller's Scenario:**

PVSC Local Limit for Copper = 3.02 mg/l

Average Annual Effluent Discharge Rate = 200,000 gal/day or 0.20 MGD

*(NOTE: Please refer to steps 1 to 3 of Part III of this document for specific instructions in calculating the post-trade concentration-based discharge limits.)*

1. Allowable discharge for seller:

$$3.02 \text{ mg/l} * 0.20 \text{ (MGD)} * 8.344 = 5.04 \text{ lb/day}$$

2. Total amount of copper credits sold is **4.20 lb/day**. Therefore, the adjusted discharge limit after the trade is:

$$5.04 \text{ lb/day} - 4.20 \text{ lb/day} = 0.84 \text{ lb/day}$$

3. Concentration limit after the trade is:

$$\frac{0.84 \text{ lb/day}}{0.20 \text{ (MGD)} * 8.344} = 0.50 \text{ mg/l}$$



# NEW JERSEY CHEMICAL INDUSTRY PROJECT

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## Appendix C

### TRADING AGREEMENT GUIDANCE

Trading Agreements for this Pilot Project should be legal contracts between trading partners. Some aspects of the agreement will relate to the business and market relationship between the parties and some will relate to the parties' ability to meet their pollutant discharge limits as adjusted by the trade. While each company will need to consider its own situation in developing the business aspects of the trade, the environmental and compliance aspects of the trade will need to be reviewed and approved by the Passaic Valley Sewerage Commissioners (PVSC).

After approving the agreement, PVSC will amend each partner's permit discharge levels to raise the discharge limit(s) of the metal(s) traded for the buyer and reduce the discharge limit(s) for the seller.<sup>1</sup> Once the agreement takes effect, each party must adhere to its adjusted discharge limits; any discharges above these adjusted limits will be considered permit violations. A violation by one party would not affect the other party's compliance status.<sup>2</sup> Both buyer and seller will be subject to the normal monitoring and reporting compliance requirements at the new levels. Companies may also be required to certify in their monthly reports that they are still adhering to their trading agreements.

The price of metals traded will be negotiated by the trading partners. The role of the agencies is to ensure that the trades are conducted in an orderly, enforceable, and environmentally sound manner, not to influence the price paid for metals credits. Prices normally would range anywhere between the marginal cost to the seller of reducing its metal discharges (marginal cost per unit times the number of units needed) to the cost the buyer would need to invest to reduce its discharges to below the new local limits.

PVSC rules state that a seller can sell excess allotments of a particular metal to as many as ten buyers, while a buyer must purchase all credits for a particular metal from a single seller. For different metals, a buyer can purchase credits from different sellers — for example, a buyer can

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<sup>1</sup> Metals that can be traded among PVSC's industrial permittees under this framework include cadmium, copper, lead, mercury, nickel, and zinc. Several metals can be traded by the same companies; however, each individual trade must be for the same pollutant: copper must be traded for copper, zinc for zinc, etc.

<sup>2</sup> If one party consistently violates its permitted discharge levels, PVSC may adjust the trade agreement and the associated discharge limits.

purchase copper credits from one seller and zinc credits from another seller. PVSC will consider allowing a consortium of companies to enter into trading agreements if this is practical. Each trading agreement must be approved by PVSC.

The time frame of the agreement can be set by the parties. Considerations should include the timing of the discharge permits of the parties, the transaction costs of negotiating and documenting new trading agreements, and the amount of flexibility needed to respond to changing business conditions.

Trading partners may want to consider terms for altering or ending the trading agreement if that becomes necessary due to changing business conditions in the future. Partners should allow each other enough time to find alternative means to meet their discharge limits. If a seller were to **unexpectedly** go out of business or discontinue the production process from which the excess metal reductions came, the buyer would lose the purchased credits. In this unexpected case, PVSC rules and regulations would allow the buyer a reasonable time to come into compliance.

Your agreement(s) should address at least the following points:

- Each agreement must contain enough information on how each party will meet its adjusted discharge limits to allow PVSC to evaluate the trading arrangement and determine that the parties have the capability to fulfill their discharge obligations under the agreement.
- The amounts of metals traded should be specified. Remember the minimum amount for a trade is one-tenth of a pound per day with amounts above that in 0.05 pound increments. 10 units must be purchased for every 8 needed. Also, to be prudent, you should use your worst case scenarios to calculate the amount of metals credits you can sell or will need to buy — any discharge above your adjusted permit limit will be a violation of your permit.
- The price should be specified as well as the terms of payment.
- If the agreement is with multiple partners, it should specify how the obligations of each partner will be met.
- The time frame of the trading should be set, as should the timing of agreement renewals and adjustments. Provisions should be made for ending the agreement, if desired or necessary, which allow adequate time for the other partner(s) to find alternative means to meet their discharge limits.

Please note: PVSC retains the right to review and raise or lower local discharge limits as needed. The usual notification that accompanies regulatory changes will be given. Parties of trading agreements may adjust their agreements to meet these new limits as needed within the time frames specified in the regulatory change notice.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

December 30, 1996

OFFICE OF  
POLICY, PLANNING AND EVALUATION

Dear PVSC Permittee:

The Environmental Protection Agency is currently working with the New Jersey Department of Environmental Protection, Passaic Valley Sewerage Commissioners (PVSC), and a Stakeholder group of batch chemical producers, environmentalists, trade associations, academics, unions, and community representatives on a project to assess current environmental protection strategies and to develop better approaches.

Our project in New Jersey is a cooperative effort, with an open and honest atmosphere where we can develop approaches that improve efficiency and environmental results, focusing on substance rather than political debate or divisiveness. First, we asked Stakeholders for their views of what works and what doesn't work in the current system, and what they would like to see as improvements. From a list of 45 possible new approaches, the Stakeholders chose to focus on four as pilot projects. One of these is trading local POTW discharge limits. Trading refers to agreements that affect the allocation of pollutant loads among facilities that discharge wastewater to POTWs.

The Trading group has decided to focus on trading copper and to attempt to set up trading among facilities in the PVSC service area. This concept has already been established and is permitted by PVSC rules and regulations. We hope that trading will make it easier and more efficient for participating facilities to meet PVSC's copper local limits and, because 20 percent of the allocation that is traded will be banked, also improve the environment. Through this effort, we hope to learn how trading may be expanded to other chemicals and to other POTW service areas.

We would like to invite you to work with us, either as a potential trading partner for copper or other metals or as an advisor to help identify and resolve issues related to trading local limits. Because the compliance deadline for PVSC's local limits for copper discharges is June 30, 1997, we would like to hear from you concerning your interest in effluent trading as soon as possible, no later than January 17, 1997.

If you would like to participate in this project, get more information, or even to just give your opinion, you may call me at 202-260-2698, fax at 202-260-0174, write to me at US Environmental Protection Agency, 401 M St., SW (mail code 2128), Washington, DC 20460, or email to me at [tunis.catherine@epamail.epa.gov](mailto:tunis.catherine@epamail.epa.gov).

Thank you for your help with this project.

Sincerely,

A handwritten signature in cursive script that reads "Catherine S. Tunis".

Catherine S. Tunis  
Project Manager



## NEW JERSEY CHEMICAL INDUSTRY PROJECT

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### Appendix E

#### TRADING PILOT QUESTIONS AND ANSWERS

- Q1: What is the purpose of effluent trading of local pretreatment limits?
- A1: Basically, it is to allow industrial facilities that discharge into a sewer system to achieve the required overall additional reductions in pollutant levels more quickly and economically. Effluent trading of local pollutant limits is encouraged by US EPA as a means of helping to achieve pollution reduction more efficiently. In this pilot project, we are looking at copper and other metals. Controlling metals levels in effluent can be very expensive. Yet when the control measures are instituted, a facility can often reduce the levels of metals in its effluent more than is required. For some facilities, instituting the control measures needed to meet new local limits would be so expensive that they would have to shut down some production processes or go out of business. Trading allows facilities within the same POTW service area to work together to control the discharge of metals in a manner that is less expensive for all parties. Trading in the Passaic Valley Sewerage Commissioners (PVSC) system is also good for the environment, since 20% of the allowable metals credits that are traded will be "banked," and not discharged.
- Q2: What is a seller?
- A2: A seller of credits is a facility that has had metals levels in its discharge that were above those allowed by the applicable local limits and has instituted control measures that have brought its metal levels down below the new local limits to achieve excess reductions in metals beyond the new requirements. The metals reduction may have come from installation of end-of-pipe control equipment, but not from discontinuing the process that produced the metal discharge. In addition, the use of pollution prevention that leads to true reductions in metals discharges may also qualify a facility as a seller.
- Q3: What is a buyer?
- A3: A buyer is a facility that has metal discharges that exceed the new local limits, and would like to meet its new requirements by purchasing a seller's excess reductions.

- Q4: What if a facility never discharged any metal and its discharge level of metals is below the local limits? Can it be a seller?
- A4: No. The new local limits were set because PVSC must lower the levels of metals in the biosolids (sludge) produced by PVSC's sewage treatment. Thus, in order to be a qualified seller, the selling facility must have taken some positive action to reduce the metal in its effluent. This reduction must have been instituted since September 1994, when PVSC passed its local limits rules, must be able to be documented, and cannot come from discontinuing the production process that caused metals in the facility's effluent.
- Q5: What metals can be traded?
- A5: The metals that can be traded are arsenic, cadmium, copper, lead, mercury, nickel, and zinc. (The local limits for chromium and molybdenum have been suspended; Federal categorical limits for these metals are still in effect.) Trading regulations require trading the same pollutant, e.g., trades would have to be copper for copper, zinc for zinc, etc.
- Q6: What is the minimum amount of metal that can be traded?
- A6: PVSC rules allow trading a minimum of one-tenth pound per day with five-hundredths pound per day increments. PVSC rules also indicate that the minimum trading quantities for any particular company must be detectable in the facility's effluent.
- Q7: Facility permit discharge limits within the PVSC service area and the new local limits are expressed in concentrations--how can the facilities buy and sell metals discharge credits by mass?
- A7: The concentrations of both the buyer's and the seller's effluent are converted to a mass quantity in pounds per day using the average annual discharge volume from the outfalls affected by the trade. A new concentration limit would be calculated based on the trading agreement. PVSC reserves the right to adjust these concentrations.
- Q8: How will trading affect the facilities' discharge permits?
- A8: Permits of the trading partners would be adjusted to reflect the amount of credits sold in the trade. Based on the self-certification of the trading partners, the discharge limits of the seller would be lowered from the new local limit by the amount sold and the discharge limits of the buyer would be raised from the local limit by 80% of the amount purchased. Both buyer and seller would be subject to the normal monitoring and reporting compliance requirements at the new levels. Facilities may also be required to certify in their monthly reports that they are still adhering to their trading agreements. Discharging a traded metal above a facility's adjusted permit discharge limit would represent a permit violation.

- Q9: What does a trading agreement look like?
- A9: A trading agreement is a legally binding contract between buyer(s) and seller(s) that must be reviewed and approved by PVSC. The agreement will have to meet the requirements of PVSC rules and regulations (Sections B-103 and B-104).
- Q10: How much would it cost to buy a copper (or other metal) credit?
- A10: That is negotiated between the trading partners. The cost would probably be somewhere between the marginal cost to the seller of providing the reductions and the cost the buyer would pay to institute its own additional control measures.
- Q11: What if a facility buys credits from a company, and then the company goes out of business unexpectedly? What will happen to the purchased credits?
- A11: The buying facility would lose the purchased credits. PVSC rules and regulations would allow that facility a reasonable time to come into compliance. This would apply also if the seller were to discontinue the production process from which the metal reductions came.
- Q12: Does a facility have to buy all the credits it needs from one seller? OR Does a selling facility have to sell its excess allotments to one company?
- A12: PVSC rules state that a seller can sell excess allotments of a particular metal to as many as ten buyers, while a buyer must purchase all credits for a particular metal from a single seller. If a buyer purchases credits for more than one metal, credits for each metal can be purchased from a different seller. PVSC has tried to make the trading requirements flexible enough so that companies could enter into agreements with more than one company if this is practical.
- Q13: How do selling facilities find buyers? OR How do buying facilities find a seller?
- A13: PVSC invited all the facilities that expressed an interest in trading to a meeting, introduced them to each other, gave them information on developing a trade, provided a list of interested trading partners, and encouraged them to negotiate. Any additional facilities interested in trading can contact PVSC for information on other potential trading partners.
- Q14: What if a facility can't find a buyer or seller? Will PVSC, DEP, or EPA guarantee that credits will be available or that facilities can sell credits that they have?
- A14: No, that is the role of the market. Communication between facilities will be key to establishing and maintaining an efficient trading program.

Q15: My question isn't answered here. How can I find out more?

A15: Call us.

Catherine Tunis, US EPA, Manager of the NJ Chemical Industry Project, 202-260-2698  
Frank D'Ascensio, PVSC, Manager of Industrial & Pollution Control, 973-817-5710  
Jim Murphy, NJ DEP, Principal Engineer of Bureau of Pretreatment and Residuals, 609-633-3823.

Q16: What if I have a problem, complaint, suggestion, or compliment about trading?

A16: Tell us! This project is intended to help us learn about the good and bad points of applying new approaches in the real world. We may not be able to fix every problem but your comments will help us evaluate the value of trading to industry and the environment.



# NEW JERSEY CHEMICAL INDUSTRY PROJECT

## APPENDIX F

### COMPARISON OF SO<sub>2</sub> TRADING AND EFFLUENT TRADING OF LOCAL LIMITS.

There are a number of significant differences between the SO<sub>2</sub> Trading program and trading local effluent discharge limits. Most of these differences appear to work in favor of making the completion of an effluent trade more difficult. The table below presents some of these differences.

<b>Exhibit F-1</b>		
<b>COMPARISON OF AIR SO<sub>2</sub> TRADING AND EFFLUENT TRADING</b>		
<b>Issue</b>	<b>SO<sub>2</sub> Trading</b>	<b>Trading of Local Effluent Pretreatment Limits</b>
Degree of Effort to Find Trading Partners	Most trading is handled by brokers that identify both buyers and sellers.	Companies must find trading partners among other companies in the POTW service area.
Style of Negotiations	Relatively "arms-length." Most trading is handled by brokers.	Very "hands-on." Companies must negotiate each trade, requiring more management resources and seeming to divulge more facility details. <sup>1</sup>
Scope of Trading	Nationwide.	Same POTW service area. <sup>2</sup>
Type of Trader	Mostly large utility companies.	Large, medium and small companies in all sectors. The key is the type and amount of pollutant in effluent.
Business Environment of Trader	Fairly stable demand for uniform product.	Some traders operate in very dynamic, competitive markets with changing products, customer demand, and changing production levels.
Type of Pollutant	One pollutant: SO <sub>2</sub> emissions.	Many pollutants in effluent can be traded. However, each individual trade must be for the same type of pollutant (e.g., copper for copper). In addition, the amount of a pollutant credit needed or available for sale can affect the success of the trade.

**Exhibit F-1 (continued)**

**COMPARISON OF AIR SO<sub>2</sub> TRADING AND EFFLUENT TRADING**

<b>Issue</b>	<b>SO<sub>2</sub> Trading</b>	<b>Trading of Local Effluent Pretreatment Limits</b>
Timing	Credits can be purchased retrospectively. The facility knows exactly how much SO <sub>2</sub> must be purchased.	Credits must be purchased/sold prospectively. Facility must project its production and operations and ensure it has sufficient credits to stay within the effluent local limits.
	Continuous, ongoing market. The same pollutant is traded each year in January.	Most of the need for trading arises at irregular intervals, i.e., when new local limits are needed.
Price Transparency	Prices are fairly public and well known among traders through an established trading market.	Price for each trade is negotiated separately and is private between traders due to the absence of a well established trading market.

<sup>1</sup> While effluent pretreatment trading may seem to require companies to divulge more information about their company operations than many company officials would like, our trading partners reported that they in fact did not need to reveal many details of their operations. On the other hand, the two trading partners felt more comfortable revealing details because they knew each other as individuals and had done business in the past. This increased level of personal comfort may have improved the chances of reaching a successful trade.

<sup>2</sup> This may increase the chances that trading partners know each other and feel comfortable negotiating trades.

## Appendix G

### GLOSSARY OF EFFLUENT TRADING TERMS<sup>1</sup>

#### **Approval Authority**

The Director in an NPDES State with an approved State Pretreatment Program or the appropriate EPA Regional Administrator for a State that has not received approval for its Pretreatment Program.

#### **Approved/Authorized Program or Approved State**

A State or interstate program which has been approved or authorized by EPA under Part 123 of the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et. seq.

#### **Banking Credits**

Under the PVSC regulations, a portion of the amount traded (20 percent) cannot be discharged; instead, it is "banked" or reserved, resulting in an immediate environmental improvement.

#### **Best Available Technology (BAT)**

A level of technology based on the very best (state of the art) control and treatment measures that have been developed or are capable of being developed and that are economically achievable within the appropriate industrial category.

#### **Categorical Pretreatment Standards**

Limitations on pollutant discharges to POTWs promulgated by EPA in accordance with Section 307 of the Clean Water Act, that apply to specific process wastewater discharges of particular industrial categories [40 CFR § 403.6 and 40 CFR Parts 405-471].

#### **Concentration-based Limit**

A discharge limit based upon the relative strength of a pollutant in a waste stream, usually expressed as the mass of pollutant per unit volume of effluent (e.g., mg/l).

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<sup>1</sup> Many of these definitions were obtained from the *Introduction to the National Pretreatment Program*, second draft, February 1998.

**Detection Limit**

The minimum concentration of an analyte (substance) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure set forth in 40 CFR Part 136, Appendix B.

**Direct Discharger**

A nondomestic discharger introducing pollutants directly to surface waters.

**Indirect Discharger**

A nondomestic discharger introducing pollutants to a publicly owned treatment works (POTW).

**Industrial Permittee (IP)**

A source (e.g., a facility) permitted to discharge pollutants to a POTW.

**Industrial User (IU)**

Any nondomestic source (e.g., a facility) discharging pollutants to a POTW. This includes both sources that are substantial enough to require permits (Industrial Permittees) and sources that do not require permits.

**Interference**

A discharge which, alone or in conjunction with a discharge or discharges from other sources, both: (1) inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and (2) therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with ... [applicable] statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations).

**Local Limits**

Conditional discharge limits imposed by municipalities upon industrial or commercial facilities that discharge to the municipal sewage treatment system (i.e., POTW).

## **Nonpoint Source**

Diffuse pollution sources (i.e., without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by stormwater. Common nonpoint sources are air deposition, agriculture, forestry, mining, construction, dams, channels, land disposal, saltwater intrusion, and city streets.

## **Mass-Based Allocation**

An approach to allocating the maximum allowable industrial loading (MAIL) by the POTW among its IPs.

## **Maximum Allowable Headworks Loading (MAHL)**

The maximum daily mass of a particular pollutant that a POTW can receive from all sources while still protecting against pass through and interference.

## **Maximum Allowable Industrial Loading (MAIL)**

The total daily mass of a particular pollutant that a POTW can accept from all permitted industrial users and ensure the POTW is protecting against pass through and interference. Calculated by applying a safety factor to the MAHL, and discounting by domestic wastewater loading.

## **Pass Through**

A discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

## **Point Source**

Any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fixture, container, rolling stock concentrated animal feeding operation vessel, or other floating craft from which pollutants are or may be discharged.

## **Pollutant**

Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into water.

**Pretreatment**

The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to, or in lieu of, discharging or otherwise introducing such pollutants into a POTW.

**Publicly Owned Treatment Works (POTW)**

Any device or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a State or municipality. This includes sewers, pipes or other conveyances only if they convey wastewater to a POTW providing treatment.

**Upset**

An exceptional incident in which there is unintentional and temporary noncompliance with permit limits because of factors beyond the reasonable control of the discharger. An upset does not include noncompliance caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.