

**Development Document for the Proposed Effluent Limitations  
Guidelines and Standards for the Meat and Poultry Products Industry  
Point Source Category (40 CFR 432)  
EPA-821-B-01-007**

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Complete proposed document available at:

<http://www.epa.gov/ost/guide/mpp/>

The Final Development Document is available as well.

## **SECTION 3**

### **DATA COLLECTION ACTIVITIES**

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EPA conducted a number of data collection activities in support of these proposed regulations. Section 3.1 describes EPA's site visit and sampling program. Section 3.2 describes EPA's industry surveys. Section 3.3 describes other information collection activities, including: literature searches, National Pollutant Discharge Elimination System (NPDES) permits, and NPDES discharge monitoring report (DMR) reports. Section 3.4 describes EPA stakeholder meetings.

#### **3.1 SUMMARY OF EPA'S SITE VISIT AND SAMPLING PROGRAM**

##### **3.1.1 EPA Site Visits**

During 2000 and 2001, EPA conducted site visits at 15 meat and poultry products (MPP) processing facilities. Six of these site visits were conducted at meat facilities, seven at poultry facilities, and two at rendering-only facilities. The purposes of these site visits were to: (1) collect information on meat and poultry processing operations; (2) collect information on wastewater generation and waste management practices used by the MPP facilities; and (3) evaluate each facility as a candidate for multi-day sampling. In addition, EPA conducted limited sampling during several of the site visits to screen for potential contaminants that may be found in wastewaters from the different types of meat and poultry processing operations.

In selecting candidates for site visits, EPA attempted to identify facilities representative of various MPP processing operations, as well as of both direct and indirect dischargers. EPA specifically considered the type of meat and poultry processing operations, age of the facility, size of facility (in terms of production), wastewater treatment processes employed, and best management practices/pollution prevention techniques used. EPA also solicited recommendations for good-performing facilities (e.g., facilities with advanced wastewater treatment technologies) from EPA Regional offices and State agencies. The site-specific

selection criteria are discussed in site visit reports prepared for each site visited by EPA (and can be found in Section 6.1.4.2 of the Administrative Record for the proposed rule).

During each site visit, EPA collected information on the facility and its operations, including: (1) general production data and information; (2) the types of meat and poultry processing wastewaters generated and treated on-site; (3) water source and use; (4) wastewater treatment and disposal operations; (5) potential sampling locations for wastewater (raw influent, within the treatment system, and final effluent); and (6) other information necessary for developing a sampling plan for possible multi-day sampling episodes. EPA also collected wastewater samples of influent and effluent at seven of the 15 facilities for screening purposes only.

### **3.1.2 EPA Sampling**

#### ***3.1.2.1 Overview***

Based on data collected from the site visits, EPA selected 11 facilities for multi-day sampling. The purpose of the multi-day sampling was to characterize pollutants in raw wastewaters prior to treatment, as well as to document wastewater treatment plant performance (including selected unit processes). Selection of facilities for multi-day sampling was based on an analysis of information collected during the site visits, as well as the following criteria:

- The facility performed meat and/or poultry slaughtering and/or further processing operations representative of MPP facilities.
- The facility utilized in-process treatment and/or end-of-pipe treatment technologies that EPA was considering for technology option selection.
- Compliance monitoring data for the facility indicated that it was among the better performing treatment systems, or that it employed wastewater treatment process for which EPA sought data for option selection.

Multi-day sampling occurred at six meat facilities and five poultry facilities. EPA performed multi-day sampling at two facilities, and nine facilities performed the multi-day

sampling on behalf of EPA. For the nine facilities that performed the sampling, EPA developed sampling plans that detailed the procedures for sample collection, including the pollutants to be sampled, location of sampling points, and sample collection, preservation, and shipment techniques. EPA assisted the nine facilities as necessary (e.g., provided sample bottle labels, provided assistance in shipping, and in one instance, provided on-site contractor support during the sampling event).

### ***3.1.1.2 Description of Sampling Episodes***

During each multi-day sampling episode, EPA sampled facility influent and effluent wastestreams. EPA did not collect source water information but will collect additional source water data after proposal. EPA will use the post-proposal source water data to better characterize wastewater characteristics for each of the facilities sampled. At some facilities, the Agency also collected samples at intermediate points throughout the wastewater treatment system to assess the performance of individual treatment units. Some of the facilities chosen for sampling perform rendering and/or further processing operations in addition to meat and/or poultry processing. For facilities that also performed rendering operations or further processing, EPA sampled wastewater from the rendering and/or further processing operations separately, when possible.

Sampling episodes were conducted over either a 3-day or 5-day period. EPA obtained samples using a combination of 24-hour composite and grab samples, depending upon the pollutant parameter to be analyzed. Depending on the type of wastewater processed and the treatment technology being evaluated, EPA analyzed wastewater for up to 53 parameters including conventional (BOD<sub>5</sub>, TSS, oil and grease, fecal coliforms, and pH), toxic (selected metals and pesticides), and nonconventional (e.g., nutrients, microbiologicals) pollutants. When possible for a given parameter, EPA collected 24-hour composite samples in order to capture the variability in the waste streams generated throughout the day (e.g., production wastewater versus clean-up wastewater).

Data collected from the influent samples contributed to characterization of the industry, development of the list of pollutants of concern and of raw wastewater characteristics. EPA used

the data collected from the influent, intermediate, and effluent points to analyze the efficacy of treatment at the facilities, and to develop current discharge concentrations, loadings, and the treatment technology options for the meat and poultry products industry. EPA used effluent data to calculate the long-term averages (LTAs) and limitations for each of the proposed regulatory options. EPA also used industry-provided data from the MPP detailed survey to complement the sampling data for these calculations. During each sampling episode, EPA also collected flow rate data corresponding to each sample collected and production information from each associated manufacturing operation for use in calculating pollutant loadings and production-normalized flow rates. EPA has included in the public record all information collected for which the facility has not asserted a claim of Confidential Business Information (CBI) or which would indirectly reveal information claimed to be CBI.

### ***3.1.2.3 Sampling Episode Reports***

EPA used the site visit reports to prepare multi-day sampling and analysis plans (SAPs) for each facility that would undergo multi-day sampling. The Agency collected the following types of information during each sampling episode:

- Dates and times of sample collection.
- Flow data corresponding to each sample.
- Production data corresponding to each sample.
- Design and operating parameters for source reduction, recycling, and treatment technologies characterized during sampling.
- Information about site operations that had changed since the site visit or that were not included in the site visit report.
- Temperature, pH, and dissolved oxygen (DO) of the sampled wastestreams.

After the conclusion of the sampling episodes, EPA prepared sampling episode reports for each facility which included descriptions of the wastewater treatment processes, sampling

procedures, and analytical results. EPA documented all data collected during sampling episodes in the sampling episode report for each sampled site and has included them in the MPP Administrative Record. Non-confidential business information from these reports is available in the public record for this proposal. For detailed information on sampling and preservation procedures, analytical methods, and quality assurance/quality control procedures, see the various sampling episode reports in the rulemaking record (see Section 6 of the Administrative Record).

#### ***3.1.2.4 Pollutants Sampled***

The Agency (or facilities, as directed by the Agency) collected, preserved, and transported all samples according to EPA protocols, as specified in EPA's "Sampling and Analysis Procedures for Screening of Industrial Effluents for Priority Pollutants" and in the MPP Quality Assurance Project Plan (QAPP).

EPA collected composite samples for most parameters, because the Agency expected the wastewater composition to vary over the course of a day. The Agency collected grab samples from unit operations for oil and grease and microbiologicals. EPA gathered composite samples either manually or by using an automated sampler. The Agency collected individual aliquots for the composite samples at a minimum of once every 4 hours over each 24-hour period. Oil and grease samples were collected every 4 hours, and microbiologicals were collected once a day.

Table 3-1 lists the parameters sampled at the majority of the facilities, some of which have not been identified as pollutants of concern.

EPA contract laboratories completed all wastewater sample analyses, except for the field measurements of temperature, dissolved oxygen, and pH. EPA or facility staff collected field measurements of temperature, dissolved oxygen, and pH at the sampling site. The analytical chemistry methods used, as well as the sample volume requirements, detection limits, and holding times, were consistent with the individual laboratory's quality assurance and quality control plan. Laboratories contracted for MPP sample analysis followed EPA approved analysis methods for all parameters.

The EPA contract laboratories reported data on their standard report sheet and submitted them to EPA's sample control center (SCC). The SCC reviewed the report sheets for completeness and reasonableness. EPA reviewed all reports from the laboratory to verify that the data were consistent with requirements, reported in the proper units, and that the data were in compliance with the applicable protocol. Appendix A provides brief descriptions of each of the analytical methods.

**Table 3-1. MPP Sampled Parameters**

Biochemical oxygen demand (BOD <sub>5</sub> )	Oil and grease
Carbonaceous biochemical oxygen demand (CBOD <sub>5</sub> )	Metals (e.g., arsenic, chromium, copper, mercury, zinc)
Dissolved biochemical oxygen demand (DBOD <sub>5</sub> )	Carbamate pesticide (carbaryl)
Chemical oxygen demand (COD)	Permethrin (cis- and trans-)
Total organic carbon (TOC)	Malathion
Total suspended solids (TSS)	Stirofos
Total dissolved solids (TDS)	Dichlorvos
Total volatile solids (TVS)	Total coliform
Chloride	Fecal coliform
Total residual chlorine (TRC)	Escherichia coli
Ammonia as nitrogen	Fecal streptococci
Nitrate/nitrite	Salmonella
Total Kjeldahl nitrogen (TKN)	Aeromonas
Total phosphorus (TP)	Cryptosporidium (meat facilities only)
Total dissolved phosphorus (TDP)	
Orthophosphate	

Quality control measures used in performing all analyses complied with the guidelines specified in the analytical methods and in the MPP QAPP. EPA reviewed all analytical data to ensure that these measures were followed and that the resulting data were within the QAPP-specified acceptance criteria for accuracy and precision. SCC's review is summarized in Data Review Narratives that are available in Section 6.1.4.2 of the Administrative Record.

### **3.2 EPA MPP INDUSTRY SURVEYS**

#### **3.2.1 Overview of Industry Surveys**

EPA did not have the site-specific technical and economic information required for the development of technologically achievable regulatory options for the meat and poultry products

industry. Therefore, EPA used two survey questionnaires to collect site-specific technical and economic information.

EPA published a notice in the Federal Register on May 1, 2000 (65 FR 25325) announcing the Agency's intent to submit the meat and poultry products industry survey Information Collection Request (ICR) to the Office of Management and Budget (OMB). The May 1, 2000 notice requested comment on the draft ICR and the survey questionnaires. EPA received five sets of comments during the 60 day public comment period. Commentors on the ICR included: National Chicken Council, National Renderers Association, American Meat Institute, BCR Foods, and the U.S. Poultry and Egg Association. EPA made minor clarifying revisions to the survey methodology and questionnaires as a result of public comments.

EPA made every reasonable attempt to ensure that the meat and poultry products industry ICR did not request data and information currently available through less burdensome mechanisms. Prior to publishing the May 1, 2000 notice, EPA met with and distributed draft copies of the survey questionnaires to three trade associations representing the meat and poultry products industry (American Meat Institute, National Chicken Council, and National Renderers Association). EPA obtained approval from OMB for the use and distribution of two survey questionnaires: a short screener survey and a more detailed survey.

### **3.2.2 Description of the Survey Instruments**

In February 2001, EPA mailed a short screener survey entitled “2001 Meat Products Industry Screener Survey” to 1,650 meat and poultry products facilities. The screener survey consisted of seven questions that elicited site-specific information such as type of animal processed and processing operation, wastewater disposal method, and the number of full-time employees at the site and company. EPA used the information collected from the screener survey to describe industry operations, wastewater generation rates, and wastewater disposal practices. EPA also used the responses to the site employment question for classifying each facility as small or not-small according to the Small Business Administration regulations at 13 CFR Part 121.



EPA designed the second survey to collect detailed site-specific technical and financial information. In March 2001, EPA mailed the second survey, entitled “2001 Meat Products Industry Survey,” to 350 meat and poultry products facilities. The detailed survey is divided into five parts. The first four parts collect general facility and technical data. The first set of questions request general facility site information. The general facility information questions asked the site to identify itself, characterize itself by certain parameters (including meat and poultry products operations, age, and location), and confirm that it was engaged in meat and/or poultry processing operations. Respondents also indicated whether they use trisodium phosphate (TSP) as a biocide. Substituting other non-phosphorus based biocides with TSP has the potential to lower overall phosphorus concentrations in the raw wastewater and treated effluent. The second set of questions requested analytical and production data including: (1) detailed daily analytical and flow rate data for selected sampling points; (2) monthly production data; and (3) operating hours for selected manufacturing operations. Survey respondents were required to provide existing sampling data and information. The Agency used the analytical data to estimate baseline pollutant loadings and pollutant removals from facilities with treatment-in-place resembling projected regulatory options and to evaluate the variability associated with meat and poultry products industry discharges. The Agency used the production data collected to evaluate the production basis for applying the MPP proposal in NPDES permits.

The next two sections of the survey focused on wastewater characteristics and current treatment practices, respectively. Questions regarding wastewater and treatment were designed to gather: (1) information on the wastewater treatment systems (including diagrams) and discharge flow rates; (2) analytical monitoring data; and (3) operating and maintenance cost data (including treatment chemical usage). The outfall information questions covered permit information such as: (1) discharge location; (2) wastewater sources to the outfall; (3) flow rates; (4) regulated parameters and limits; and (5) permit monitoring data. The Agency used this information to calculate the effluent limitations guidelines and standards and pollutant loadings associated with the regulatory options that EPA considered for this proposal. The Agency also used data received in response to these questions to identify treatment technologies in place, to determine the feasibility of regulatory options and potential revision of the subcategorization scheme of the

meat and poultry products industry, and to estimate compliance costs, the pollutant reductions associated with the likely technology-based options, and potential environmental impacts associated with the regulatory options EPA considered for this proposal.

The fifth part of the detailed survey elicited site-specific financial and economic data. EPA used this information to characterize the economic status of the industry and to estimate potential economic impacts of wastewater regulations. The financial and economic information collected in the survey was necessary to complete the economic analysis of the proposed effluent limitations guidelines and standards for the meat and poultry products industry. EPA requested financial and economic information for the fiscal years ending 1997, 1998, and 1999, the most recent years for which data are available.

### **3.2.3 Development of Survey Mailing List**

EPA sent the two meat and poultry products industry survey questionnaires to a random sample of facilities included in the USDA Food Safety and Inspection Service (FSIS) Hazard Analysis and Critical Control Points (HACCP) database, and a list of renderers provided by the National Renderers Association (NRA). The HACCP database provided a list of 7,891 federally- and state-inspected meat and poultry processing facilities. The HACCP database is dated March 9, 2000 for the federally inspected facilities and May 10, 2000 for the state-inspected facilities. The entire HACCP database is classified into Large, Small, and Very Small facilities, corresponding to more than 500 employees, 10-500 employees, and fewer than 10 employees at the facility level, respectively. The 231 renderers from the NRA list were not classified by size. The Urner Barry Meat and Poultry Directory 2000 identified production information (i.e., whether a facility was a slaughterer or further processor) for at least 242 of the 292 large facilities (82 percent) and 1,236 of the 2,381 small facilities (52 percent). No such information was available for the remaining large and small facilities or for any of the 5,308 very small facilities.

### **3.2.4 Sample Selection**

EPA grouped the facilities into seven strata by the size and the type of meat and poultry processing operation that takes place in each facility, so that each stratum would encompass

facilities with similar operations. This grouping (also known as stratification) increases precision (reducing one source of uncertainty) for estimates of costs, benefits and other quantities. Table 3-2 lists the stratification of the meat and poultry products industry based on employment and other information from USDA’s HACCP program, the Urner Barry Meat and Poultry Directory 2000, and the National Renderers Association.

Various meat and poultry processors were randomly selected within each grouping. EPA weighted each survey response to account for facilities not surveyed and to develop national estimates from the survey responses. EPA deliberately selected the 65 “certainty” facilities to obtain site-specific information on the top producers for all types of meat and poultry products as well as facilities identified as good performers by state and regional environmental personnel.

**Table 3-2. Meat and Poultry Products Industry Strata**

<b>Stratum (No. of Employees)</b>	<b>Number of Facilities in Stratum</b>	<b>Screening Survey Sample Size</b>	<b>Detailed Survey Sample Size</b>
Certainty	65	0	65
Large Processor (≥500)	43	31	3
Large Slaughterer (≥500)	190	100	52
Small Processor (10-499)	1,878	688	62
Small Slaughterer (10-499)	498	130	69
Very Small Processor (<10)	5,308	649	57
Renderer	235	52	42
Total	8,217	1,650	350

EPA focused much of its analysis on the characteristics of larger facilities since small facilities as a group discharge fewer than 3 percent of the conventional pollutants, 1 percent of the toxic pollutants, 4 percent of the nutrients, and less than 1.5 percent of the pathogens as compared to all discharges from the entire MPP industry. Moreover, most of these small facilities are discharging small volumes of wastewater into large urban publicly owned treatment

works (POTW) systems, which helps minimize impacts. Thus there is minimal impact on POTW operations or the passing of MPP pollutants of concern through POTWs into waters of the United States. Consequently, larger facilities were oversampled in the sample design. The oversampling rate is approximately 6:3:1, meaning that the large facilities were sampled at six times the rate of the very small facilities, and the small facilities at three times the rate of the very small. In addition, many of the very small facilities were not eligible for the survey, as they were no longer in operation. Appendix B provides additional information on how the Agency designed the survey, developed sample size and extrapolated survey results

### **3.2.5 Survey Response**

Of the 8,217 meat and poultry products industry facilities generating wastewater, 2,000 facilities were mailed either a detailed survey or a screener survey questionnaire. As of October 4, 2001, 1,365 of the 1,650 screener surveys and 300 of the 350 detailed surveys were returned to EPA. EPA used 962 of the screener surveys and 241 of the detailed surveys which were received before April 24, 2001 for screener survey and May 29, 2001 for detailed survey, for the development of various regulatory options. EPA used the cut-off dates in order to process, synthesize, and analyze the collected data and to develop regulatory options in a timely fashion. EPA will use all surveys collected after the deadlines in upcoming analyses for the forthcoming Notice of Data Availability (NODA) and final rule.

### **3.3 OTHER INFORMATION COLLECTION ACTIVITIES**

EPA conducted a number of other data collection efforts to supplement information gathered through the survey process, facility sampling activities, site visits, and meetings with industry experts and the general public. The main purpose of these other data collection efforts was to obtain information on documented environmental impacts of meat and poultry processing industry facilities, additional data on animal processing waste characteristics, pollution prevention practices, wastewater treatment technology innovation, and facility management practices. These other data collection activities included a literature search, a review of current NPDES permits, and NPDES DMRs.

### **3.3.1 Literature Search on Environmental Impacts**

EPA conducted a literature search to obtain information on various aspects of the animal processing industry, including documented environmental impacts, wastewater treatment technologies, waste generation and facility management, and pollution prevention. EPA performed extensive internet and library searches for applicable information. The Agency used the resources of its own environmental library and of the United States Department of Agriculture's (USDA) National Research Library to obtain technical articles on environmental issues relating to the animal processing industry. Researchers also consulted several university libraries and industry experts during the literature search. As a result, EPA was able to compile a list environmental impacts associated with the meat and poultry processing industry. The scope of the literature search included government reports of permit violations and any associated environmental impacts. EPA has included a summary of the case studies in the Administrative Record associated with the MPP proposal. The primary sources for the case studies include newspaper and technical journal articles, government reports, and papers included in industry and academic conference proceedings.

### **3.3.2 Current NPDES Permits**

EPA extracted information from the Agency's Permit Compliance System (PCS) to identify meat and poultry processing industry point source dischargers with NPDES permits. This initial extraction was performed by searching the PCS using reported Standard Industrial Classification (SIC) codes used to describe the primary activities occurring at the site.

Specifically, the following SIC Codes were used:

- 2011—Meat Packing Facilities
- 2013—Sausages and Other Prepared Meats
- 2015—Poultry Slaughtering and Processing
- 2077—Animal and Marine Fats and Oils.

EPA identified 359 active meat and poultry product facilities with NPDES permits in the PCS database. The PCS estimate of MPP direct dischargers is approximately equivalent to the

screening survey estimate of direct dischargers. For the final rule, EPA will refine its estimates of direct dischargers to incorporate information from both the PCS database and the screening survey.

EPA selected a sample from this universe of direct dischargers in the PCS database. The Agency then reviewed NPDES permits and permit applications to obtain information on treatment technologies and wastewater characteristics for each of the respective animal processing and rendering sectors. EPA used this information as part of its initial screening process to identify the universe of processing facilities that would be covered under the proposal. In addition, the Agency used this information to better define the scope of the information collection requests and to supplement other information collected on meat and poultry processing waste management practices.

### **3.3.3 Discharge Monitoring Reports**

In addition, the Agency collected long-term effluent data from facility DMRs via the PCS database in an effort to perform a “real world” check on the achievability of the MPP proposal limits. DMRs summarize the quality and volume of wastewater discharged from a facility under a NPDES permit. DMRs are critical for monitoring compliance with NPDES permit provisions and for generating national trends on Clean Water Act compliance. DMRs may be submitted monthly, quarterly, or annually depending on the requirements of the NPDES permit.

EPA extracted discharge data and permit limits from these DMRs (via the PCS database) to help identify pollutants of concern (i.e., which pollutants are currently being regulated) and to identify better performing facilities. Specifically, EPA identified the amount of discharged ammonia in relation to the respective permit limits. EPA conducted this analysis in part to identify potential facilities for future sampling, as well as to assist in identifying a selection of facilities for the certainty component of the detailed survey exercise.

EPA was able to collect DMR information on a total of 176 facilities from four MPP sectors: 77 meat packing facilities; 17 facilities producing sausages and other prepared meat

products; 65 poultry slaughtering and processing facilities; and 17 animal and marine fat and oils facilities. EPA collected 31,311 data points on 83 separate pollutant parameters.

Indirect dischargers file compliance monitoring reports with their control authority (e.g., POTW) at least twice per year as required under the General Pretreatment Standards (40 CFR 403), while direct dischargers file discharge monitoring reports with their permitting authority at least once per year. EPA did not collect compliance monitoring reports for MPP facilities that are indirect dischargers, as: (1) a vast majority of MPP indirect dischargers are small facilities (i.e., small volumes of wastewater); and (2) this information is less centralized and harder to collect.

Because DMR and indirect discharger compliance monitoring reports do not provide information about processes and production, EPA was not able to use these data directly in calculating the limitations and standards. Instead, in the detailed survey, EPA requested that facilities provide the individual daily measurements from their monitoring (for DMR or the control authority) with detailed information about their treatment systems and processes. After further evaluation of the detailed surveys, EPA intends to use the self-monitoring data corresponding to the proposed treatment options to calculate the final limits and to reassess the achievability of the limits by well-operated BAT systems. In cases where EPA determines that improved system operation will allow the limits to be consistently achieved, it will include additional treatment costs for the facility in its cost estimations for the final rule where it has not already done so. In following the approach described above, EPA concludes that it will address issues related to the achievability of the numerical limits by well-operated and economically achievable treatment systems.

### **3.4 STAKEHOLDER MEETINGS**

EPA encouraged the participation of all interested parties throughout the development of the MPP proposal. EPA conducted outreach to the following trade associations (which represent the vast majority of the facilities that will be affected by this guideline): American Meat Institute (AMI), American Association of Meat Processors (AAMP), National Renderers Association (NRA), U.S. Poultry and Egg Association, and the National Chicken Council. EPA met on

several occasions with various industry representatives to discuss aspects of the regulation development. EPA also participated in industry meetings and gave presentations on the status of the regulation development. Summaries of these meetings are in the rulemaking Administrative Record.

In the development of the surveys used to gather facility specific information on this industry, EPA consulted with the industry groups and several of their members to ensure that the information was being requested in an intelligible manner, and that they would provide it in the form requested.

EPA also met with representatives from USDA to discuss this regulation and how it might either be affected by or affect requirements on the meat and poultry processing industry implemented by the Food Safety and Inspection Service of USDA. EPA has met with representatives from state and local governments to discuss their concerns with meat and poultry processing facilities and how EPA should approach these facilities in regulation. Summaries of these meetings are in the Administrative Record. Additionally, EPA Regional and State pretreatment coordinators were contacted to identify MPP indirect dischargers that were causing POTW interference or pass through. The results of this limited search is summarized in Section 13 and in the rulemaking Administrative Record. EPA plans to conduct a more systematic and thorough study of POTWs accepting MPP indirect discharges to better characterize interference and pass through issues. EPA will present the results of the findings in the forthcoming NODA.