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February 25, 2013

U.S. Environmental Protection Agency
Water Permits Division
Attention: Mr. Bryan Rittenhouse
Industrial Stormwater Program
1200 Pennsylvania Avenue, NW
Washington, DC 20460-0001

Re: Comments on Copper Benchmark in Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP)

Dear Mr. Rittenhouse:

The Copper Stormwater Benchmark Coalition (CSBC) [comprised of the American Foundry Society, Institute of Scrap Recycling Industries, Non-Ferrous Founders' Society, Steel Founders' Society of American, Steel Manufacturers Association and Treated Wood Council (TWC)] is pleased to submit this report addressing to the current copper benchmark values in place in the 2008 Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP). This report is in anticipation of the upcoming proposed MSGP revision and public comment process.

The primary concern for CSBC and their member companies is the battery of extremely low benchmark values for copper.

Executive Summary

Copper is a hardness-dependent metal, meaning the benchmark value for a facility is based on the total hardness of the receiving stream. The copper benchmark values range from 0.0038 mg/L to 0.0332 mg/L and were established based on acute toxicity values to aquatic life. There are a number of scientific points that suggest that the current benchmark concentrations are not the ideal concentrations upon which to base an industrial stormwater benchmark value. The CSBC proposes recommendations based on four main concerns with the current copper benchmark values. These concerns are as follows:

1. The achievability of the current copper benchmark value at industrial facilities with the use of water quality controls.
2. The presence of copper above the current benchmark value in non-industrial stormwater discharges.
3. The failure of grab samples taken in the first 30 minutes of a stormwater event to accurately represent the pollutant concentrations coming from an industrial facility.
4. The misrepresentation of using total copper as the copper benchmark when acute toxicity criteria are derived from dissolved copper concentrations.

With these concerns in mind, we conducted extensive research looking into the supporting US EPA documentation, as well as online stormwater databases containing data from both industrial and non-industrial facilities. In addition, data from facilities of many TWC

members were collected. From this research and data, the CSBC would like to offer four recommendations on the copper benchmark values for the US EPA's consideration, with the goal to better represent the original intent of benchmark monitoring in the MSGP.

1. **EPA should seek comments from impacted industry groups to gather a better understanding of representative copper values for various technology-based stormwater controls.**

While the EPA describes the use of benchmark values as means for facilities to assess the effectiveness of their stormwater control measures, the EPA provides no data as part of the 2008 MSGP that show whether current benchmark values are "technologically available and economically practicable and achievable in light of best industry practice to meet the technology-based effluent limitations." In addition, the current copper benchmark values are based on water quality criteria, not technology. From the data available in the US EPA's National Pollutant Discharge Elimination System National Stormwater Quality Database v. 1.1 (NSQD) as well as from the data gathered from the facilities of TWC members, there is strong evidence showing that the majority of stormwater sampling data available fails to meet the current copper benchmark. From the TWC members, we reviewed 924 samples taken from 45 locations at 22 facilities located throughout the United States. From the data collected, 93.8% of total copper samples failed to meet the current copper benchmark. These facilities currently employ numerous technology-based stormwater controls including retention ponds, detention ponds, rip rap spillways, and filtration units. Despite the failure to meet the copper benchmark at a high percentage for these CSBC facilities, none of the receiving waters for the facilities are listed as 303(d) impaired streams for copper. This demonstrates an important lack of evidence that copper levels above the current benchmarks do substantial harm to aquatic life.

The median total copper concentration for industrial sites within the US EPA NSQD was 0.022 mg/L and 0.016 mg/L for all land use categories. This concentration corresponds to an exceedance of the current benchmark for facilities whose receiving water body has a hardness of 125 mg/L and below (which is most water bodies in the United States). The International Stormwater Best Management Practice (BMP) Database, which compiles stormwater sampling results from mixed sources internationally including industrial, commercial, and residential facilities, lists removal efficiencies of 36-70% for total and dissolved copper for various technology-based stormwater controls. Even with these removal efficiencies, the majority of industrial facilities would still fail the current copper benchmark based on the hardness of their respective receiving water body. The current copper benchmark does not accurately reflect what is technologically achievable and economically practicable and achievable in light of best industry practice.

2. **EPA should consider stormwater data for copper provided from other land use categories (including residential and commercial run-off) for further proof that the current copper benchmarks are not achievable at their current values.**

The US EPA NSQD also provides stormwater sampling data on total and dissolved copper concentrations for different land use categories. Looking at median concentrations for total copper for different land use categories and comparing those concentrations to the copper benchmark based on the receiving water body's hardness, the following land use

categories fail to meet the current copper benchmark for industrial facilities: residential, mixed residential, commercial, mixed commercial, industrial, mixed industrial, freeway, and mixed freeway. In addition, the following land use categories also fail the current total copper benchmark using dissolved copper concentrations: residential, commercial, mixed commercial, industrial, mixed industrial, and freeway. Establishing a benchmark value for industrial facilities that is currently not being achieved at most residential facilities is contradictory to the stated intent of technology-based benchmark values, and intuitively inappropriate.

3. **EPA should, at a minimum, raise the current copper benchmark concentrations by 24% to reflect the difference in stormwater pollutant concentrations coming from a grab sample during the first 30 minutes of a stormwater event versus stormwater pollutant concentrations over the duration of a longer stormwater event.**

The current benchmark values for copper are based on grab samples taken from the first 30 minutes of a stormwater event (the first-flush). However, the acute toxicity values which determine the copper benchmark are typically derived from exposure durations of 96 hours (96 hour LC50, i.e. median lethal concentration). The pollutant concentration in stormwater run-off from most industrial facilities is significantly higher in the first-flush than in subsequent discharge and is not representative of the pollutant concentrations that biota will be exposed to. The US EPA NSQD contains both grab and composite samples for over 3,000 stormwater events from over 300 sites throughout the United States. The flow-weighted composite samples available are for the entire time of a discharge from a site for up to 3 hours. From comparisons of median total copper concentrations at industrial facilities from first-flush samples and composite samples, there was found to be a ratio of 1.24.

4. **In addition to recommendation 3, apply an additional adjustment factor of 100% to the current copper benchmark to account for the reduced bioavailability of copper in total samples as compared to dissolved samples.**

The current copper benchmark is for total copper, but dissolved copper is more representative of the bioavailability of copper. Furthermore, the acute criteria (which is the basis for the current benchmark value) is derived from dissolved copper concentrations. Because the reduced bioavailability of copper in total samples as opposed to dissolved samples is not accounted for in the benchmark, stormwater sampling data from the US EPA NSQD and TWC members' were analyzed. By comparing the differences in concentrations between total and dissolved copper, it was determined that the mean percentage decrease between total copper and dissolved copper concentrations from TWC facility data was 44.21%. The same analysis for the sampling data found in the US EPA NSQD yielded a percentage decrease of 57.46% from total copper to dissolved copper concentrations (i.e. total copper concentrations tend to be twice that of dissolved copper). It is our recommendation that as a result of these differences, the current total copper benchmark concentrations should be raised by 100%.

It is with these recommendations that the CSBC hopes to make the copper benchmark more representative of the effectiveness of stormwater controls at industrial facilities and more indicative of the potential impact to aquatic life.

A more detailed summary of our findings is presented in the Appendix to this letter.

We recommend that EPA cite these specific concerns in the upcoming proposed MSGP revisions and request more information on them in the public notice. We are certainly available to meet with you on these concerns.

Once again, the CSBC appreciates the opportunity to submit this report to the Agency. Please contact Mr. Jeff Miller of the Treated Wood Council (jeff_miller@treated-wood.org , 202-641-5427) if you have any additional questions.

Respectfully submitted,

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Executive Vice President
American Foundry Society

Raymond W. Monroe
Executive Vice President
Steel Founders' Society of America

Robin Wiener
President
Institute of Scrap Recycling Industries, Inc.

Thomas A. Danjczek
President
Steel Manufacturers Association

James L. Mallory
Executive Director
Non-Ferrous Founders' Society

Jeffrey T. Miller
President & Executive Director
Treated Wood Council

(submitted via email to rittenhouse.bryan@epa.gov)

APPENDIX

SUPPORTING DOCUMENTATION

Obtaining Data on the Achievability of the Copper Benchmark Values with the Use of Water Quality Controls

Stormwater sampling data were obtained from TWC members for total copper. We reviewed 924 samples taken from 45 locations at 22 facilities located throughout the United States. From this data, the median copper concentration of samples was found to be 0.11 mg/L. Comparing the received total copper concentrations to their respective benchmark, 93.8% of samples failed to meet the copper benchmark. These facilities currently employ numerous technology-based stormwater controls including retention ponds, detention ponds, rip rap spillways, and filtration units. Despite the failure to meet the copper benchmark at a high percentage for these TWC facilities, none of the receiving waters for the facilities are listed as 303(d) impaired streams for copper. This demonstrates an important lack of evidence that copper levels above the current benchmarks do substantial harm to aquatic life. Still, to explore the availability of additional controls to lower these concentrations to under the current benchmark, we examined two different stormwater databases as well as outside studies on technology-based stormwater controls.

First, a statistical analysis was performed on stormwater data from the International Stormwater Best Management Practice (BMP) Database. This database compiles stormwater sampling results from mixed sources internationally, including industrial, commercial, and residential facilities. Table 1 shows removal efficiencies of median total copper concentrations at the inlet versus outlet for various BMPs.

Table 1: Removal Efficiency (%) Summary Table for Total Copper

BMP Type	Removal Efficiency for Median Total Copper Concentration
	In vs Out
Grass Strip	70.23
Bioretention	54.88
Bioswale	39.78
Composite	46.20
Detention Pond	46.61
Manufactured Device	24.29
Media Filter	46.72
Porous Pavement	40.09
Retention Pond	47.86
Wetland Basin	36.36

From Table 1, the technology-based stormwater controls reduced median total copper concentrations with a removal efficiency of 36-70%. Even with these removal efficiencies, the majority of industrial facilities would still fail the current copper benchmark based on the hardness of their respective receiving water body.

Additionally, we examined the US EPA National Pollutant Discharge Elimination System National Stormwater Quality Database v. 1.1 (NSQD), which contains over 3,000 events from over 300 sites throughout the United States. The NSQD compiled stormwater sampling data containing total copper concentrations at industrial sites, and the median total copper concentration was 0.022 mg/L. This concentration would cause an exceedance of the copper benchmark for receiving water bodies with hardness of 150 mg/L and below.

We then contacted businesses who sold high-end technology-based stormwater controls to identify the best controls available on the market. These technology-based controls mimicked water treatment processes and included enhanced media filtration systems, gravity settling tanks, and polishing filtrations tanks. Through the use of top-down filtration with a slow-sand filter, a biofilm layer forms on top of the enhanced media which removes copper in stormwater. In series, these technologies could remove copper from stormwater at a removal efficiency of 70-90%. For some industrial facilities, this technology may provide a high enough removal efficiency to comply with the copper benchmark; however, this technology would still not be sufficient for most facilities.

From the data analyzed, the current copper benchmark does not accurately reflect what is technologically achievable and economically practicable and achievable in light of best industry practice. In addition, we have not been able to locate any EPA data or study that has shown otherwise.

Obtaining Data on Copper Concentrations in Non-Industrial Stormwater

The US EPA NSQD also includes median total copper concentrations for different land use categories. These data were analyzed to see which land use categories failed the current total copper benchmark using the hardness published. The results are shown in Table 2 below. The bolded values (9 out of 11) show concentrations which fail to meet the respective copper benchmark.

Table 2: Summary of US NPDES Phase 1 Stormwater Data in the NSQD

Land Use Categories	Total Copper (mg/l)	Total Hardness (mg/l)	Benchmark Value of Copper as a Function of the Tested Hardness (mg/l)
Overall	**0.0160**	38	0.0056
Residential	**0.0120**	32	0.0056
Mixed Residential	**0.0160**	40	0.0056
Commercial	**0.0170**	36.5	0.0056
Mixed Commercial	**0.0175**	36	0.0056
Industrial	**0.0208**	39	0.0056
Mixed Industrial	**0.0230**	29.3	0.0056
Freeway	**0.0347**	34	0.0056
Mixed Freeway	**0.0140**	83	0.0123
Open Space	0.0100	150	0.0221
Mixed Open Space	0.0090	64.2	0.0090

As can be seen above, the majority of land use categories fail the current copper benchmark for industrial facilities. Establishing a benchmark value for industrial facilities that is currently not being achieved at most residential facilities is contradictory to the stated intent of technology-based benchmark values.

Obtaining Data that Correlated Pollutant Concentrations in Grab Samples to Pollutant Concentrations in Flow-Weighted Composite Samples

The US EPA NSQD released a report in September of 2005 which compiled and analyzed the stormwater monitoring information obtained from the NPDES Phase 1 permit applications during the period of 1992-2002. Because grab and composite samples were required for each event, comparisons were able to be made between first-flush samples within the first 30 minutes of discharge and flow-weighted composite samples for the entire time of discharge for up to 3 hours. Commercial, industrial, and institutional areas were sorted, and a ratio for each was calculated comparing first flush samples to composite median concentrations. The results for total copper at industrial facilities were reviewed, and the median values of total copper concentrations for first-flush and composite samples were found to be different at a ratio of 1.24.

From this data, it is recommended that the current copper benchmark concentrations are raised by 24% at a minimum to reflect the difference in stormwater pollutant concentrations coming from a grab sample during the first 30 minutes of a stormwater event versus stormwater pollutant concentrations in longer composite samples.

Obtaining Data that Correlated Total Copper Concentrations to Dissolved Copper Concentrations

The acute toxicity criteria for biota which dictated the current benchmark concentration for copper was derived from dissolved copper concentrations. However, the copper benchmark is for total copper. Because the reduced bioavailability of copper in total samples as opposed to dissolved samples is not accounted for in the benchmark, the sampling data obtained from TWC members were analyzed to compare the differences in concentration between total copper and dissolved copper. From this, it was determined that the mean percentage decrease between total copper and dissolved copper concentrations was 44.21%.

The stormwater data for copper in the US EPA NSQD were also compared, and it was found that dissolved copper concentrations were an average of 57.46% lower than total copper concentrations.

Figure 1 below shows a scatter plot of dissolved copper concentrations versus total copper concentrations, which was put together by Robert Pitt, Alex Maestre, and Renee Morquecho of the University of Alabama, analyzing data points from the US EPA NSQD. As is expected, few data points fall on the y=x line and most lie under the y=x line, indicating that dissolved copper concentrations are less than total copper concentrations (sometimes by as much as an order of magnitude).

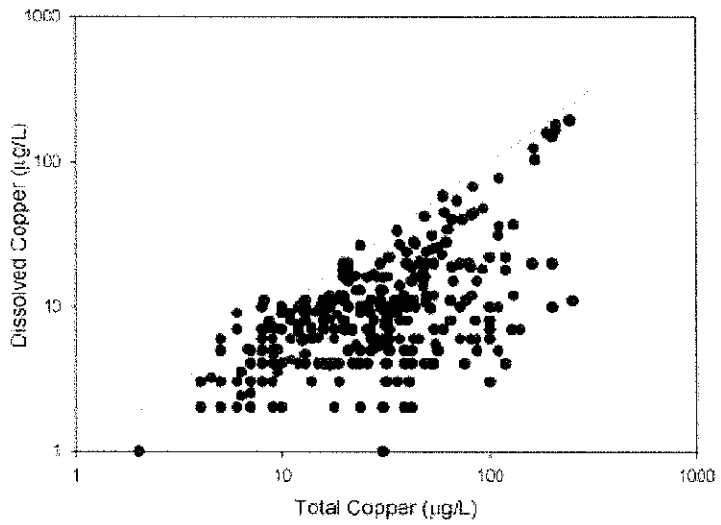

Figure 1: Dissolved vs Total Copper Concentration from US EPA NSQD Sampling Data

It is our recommendation that as a result of these differences, the current total copper benchmark concentrations should be raised by 100%.

Additional Information

The Nationwide Urban Runoff Program, established by the US EPA, was created to examine issues with urban runoff. An interim report was published in March 1982 and again as a final report in December 1983 detailing the many studies, technical reports, and the summary database created detailing detention and recharge devices, urban runoff effects on the water quality of rivers and streams, street sweeping as a water pollution control, and more. In Volume 1 of this report, a table is given showing regional differences in toxic concentrations for copper given a stream's total hardness. Suggested values are then given for threshold effects (mortality of the most sensitive individual of the most sensitive species) and significant mortality (a) (mortality of 50 percent of the most sensitive species) and (b) (mortality of the most sensitive individual of 25th percentile sensitive species). Table 4 shows this data below, along with the current benchmark for copper.

Table 4: Toxic Concentration Levels

Pollutant	Stream Total Hardness (mg/L)	Suggested Values For			Current Benchmark Value (mg/L)
		Threshold Effects (mg/L)	Significant Mortality (mg/L)		
			(a)	(b)	
Total Copper	50	0.020	0.050	0.090	**0.0090**
	200	0.080	0.180	0.350	**0.0285**
	300	0.115	0.265	0.500	**0.0332**

While this report is from 1983, the disparity between current benchmark values and suggested values in the above table is worth noting.

SBA
Office of Advocacy
www.sba.gov/advo

Advocacy: the voice of small business in government

March 14, 2006

The Honorable Benjamin Grumbles
Assistant Administrator
Office of Water
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, DC 20460

Re: Docket ID No. OW-2005-0007; Comments on Proposed 2006 Multi-Sector General Permit (MSGP) for Industrial Facilities (70 Fed. Reg. 72116, December 1, 2005)

Dear Assistant Administrator Grumbles:

We are submitting these comments on the proposed Multi-Sector General Permit (MSGP) which covers over 3,656 facilities and may serve as a model for state programs that issue their own permits. The proposed Permit affects facilities in 29 industrial sectors, including mining, logging, manufacturing, transportation and landfills, sixty percent of which we estimate is small business.[1] Although this letter is submitted after the public comment period, the Office of Advocacy is hopeful that our comments will assist the U.S. Environmental Protection Agency (EPA) as it works to finalize the MSGP.

First, the Office of Advocacy believes the issuance of the MSGP constitutes a rulemaking and should proceed with the analytical and public comment requirements, such as the Regulatory Flexibility Act (RFA), of a rulemaking.[2] Second, in response to EPA's request for comment on analytical monitoring and the benchmarks derived therein,[3] the Office of Advocacy offers the attached Technical Memorandum to assist the agency's study.[4]

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[1] The 29 industrial sectors are listed in Table 2 of the 2006 MSGP Fact Sheet. Although we estimate about 90% of the affected firms are small businesses, large businesses are more likely to own multiple facilities, making the small business share of facilities around 60%.

[2] Pub. L. No. 96-354, 94 Stat. 1164 (1980) (codified at 5 U.S.C. §§ 601-612) amended by Subtitle II of the Contract with America Advancement Act, Pub. L No. 104-121, 110 Stat. 857 (1996). 5 U.S.C. § 612(a).

[3] 2006 MSGP Fact Sheet at 39.

[4] Technical Memorandum was prepared by E.H. Pechan & Associates, Inc. (March 2006).

Congress established the Office of Advocacy (Advocacy) under Pub. L. 94-305 to represent the views of small business before federal agencies and Congress. Advocacy is an independent office within the Small Business Administration (SBA), so the views expressed by Advocacy do not necessarily reflect the views of the SBA or the Administration. Section 612 of the Regulatory Flexibility Act (RFA) requires Advocacy to monitor agency compliance with the RFA, as amended by the Small Business Regulatory Enforcement Fairness Act. The RFA requires federal agencies to consider the impacts of their regulatory proposals on small entities, and determine whether there are effective alternatives that would reduce the regulatory burden on small entities.

On August 13, 2002, President George W. Bush signed Executive Order 13272 that requires federal agencies to implement policies protecting small entities when writing new rules and regulations.[5] This Executive Order highlights the President's goal of giving "small business owners a voice in the complex and confusing federal regulatory process"[6] by directing agencies to work closely with the Office of Advocacy and properly consider the impact of their regulations on small entities. In addition, Executive Order 13272 authorizes Advocacy to provide comment on draft rules to the agency that has proposed the rule, as well as to the Office of Information and Regulatory Affairs (OIRA) of the Office of Management and Budget.[7] Executive Order 13272 also requires agencies to give every appropriate consideration to any comments provided by Advocacy. Under the Executive Order, the agency must include, in any explanation or discussion accompanying the final rule's publication in the Federal Register, the agency's response to any written comments submitted by Advocacy on the proposed rule, unless the agency certifies that the public interest is not served by doing so.[8]

I. The Proposed MSGP Should be Considered a Rulemaking and Therefore Meets the Requirements of the Regulatory Flexibility Act (RFA)

While the EPA conducted some analysis and, specifically, documented cost estimates and small business impact,[9] EPA failed to formalize the Regulatory Flexibility Act (RFA) analysis in its MSGP proposal, claiming instead that "[i]ssuance of an NPDES general permit is not subject to rulemaking requirements ... and is thus not subject to the RFA requirements."[10] The purported basis of EPA's determination that the RFA does not apply is rooted in the Administrative Procedure Act's (APA) definition of "rules" and "orders." EPA states that:

> The APA defines two broad, mutually exclusive categories of agency action—''rules'' and ''orders''. Its definition of ''rule'' encompasses ''an agency

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[5] Exec. Order. No. 13272 § 1, 67 Fed. Reg. 53,461 (2002).
[6] White House Home Page, *President Bush's Small Business Agenda*, (announced March 19, 2002) (last viewed February 8, 2006) <http://www.whitehouse.gov/infocus/smallbusiness/regulatory.html>.
[7] E.O. 13272, at § 2(c).
[8] *Id.* at § 3(c).
[9] 2006 MSGP Fact Sheet at 65 and 70.
[10] 70 Fed. Reg. 72116, 72120, December 1, 2005.

> statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy or describing the organization, procedure, or practice requirements of an agency...'' APA section 551(4). Its definition of ''order'' is residual: ''a final disposition... of an agency in a matter other than rule making but including licensing.'' APA section 551(6) (emphasis added). The APA defines ''license'' to ''include ... an agency permit...'' APA section 551(8). The APA thus categorizes a permit as an order, which by the APA's definition is not a rule. Section 553 of the APA establishes ''rulemaking''requirements. The APA defines ''rule making'' as ''the agency process for formulating, amending, or repealing a rule.'' APA section 551(5). By its terms, then, section 553 applies only to ''rules'' and not also to ''orders,'' which include permits.[11]

Advocacy disagrees with EPA's conclusion that this action is not a rulemaking and not subject to the RFA.

EPA's reliance on the definition of "order" is misplaced. The United States Court of Appeals for the District of Columbia Circuit addressed this exact issue in *National Association of Home Builders v. Army Corps of Engineers*, 417 F. 3d 1272 (D.C. Cir. 2005). Like EPA, the Army Corps of Engineers argued that its permitting action did not constitute a "rule." It was an "order" because "order" included a "licensing" disposition and a "license" included a "permit." The court considered the argument an "elaborate statutory construction" and rejected it for a more straightforward one.[12] The court found that the permitting action fit within the APA's definition of "rule" because each permit was a legal prescription of general and prospective applicability which the Corps issued to implement permitting authority that Congress entrusted to it pursuant to the Clean Water Act. As such, the action constituted a rule because it was an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy.[13]

In addition, the court found that the Army Corps of Engineers action was a legislative rule because the permits authorized the discharge of certain materials, granted rights, imposed obligations, and produced other significant effects on private interests. Accordingly, they were subject to the notice and comment requirements of the APA and to the requirements of the RFA.[14]

Likewise, the EPA's general permit policy for stormwater discharges is a legislative rule. Like the Army Corps of Engineers, EPA is issuing the rulemaking to implement its permitting authority pursuant to the Water Quality Act of 1987 and the Clean Water Act,

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[11] Id.
[12] *National Association of Home Builders v. Army Corps of Engineers*, 417 F. 3d 1272, 1284 (D.C. Cir. 2005).
[13] Id.
[14] Id.

which directs EPA to develop a phased approach to regulate stormwater discharges.[15] The EPA's permits will also grant rights, impose obligations, and produce other significant effects on private interests. Accordingly, the permits being issued by EPA are subject to the requirements of the RFA as were the permits issued by the Army Corps of Engineers.

The RFA requires agencies to consider the economic impact that a proposed rulemaking will have on small entities. Pursuant to the RFA, the agency is required to prepare an initial regulatory flexibility analysis (IRFA) to assess the economic impact of a proposed action on small entities. The IRFA must include: (1) a description of the impact of the proposed rule on small entities; (2) the reasons the action is being considered; (3) a succinct statement of the objectives of, and legal basis for the proposal; (4) the estimated number and types of small entities to which the proposed rule will apply; (5) the projected reporting, recordkeeping, and other compliance requirements, including an estimate of the small entities subject to the requirements and the professional skills necessary to comply; (6) all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule; and (7) all significant alternatives that accomplish the stated objectives of the applicable statutes and minimize any significant economic impact of the proposed rule on small entities. In preparing its IRFA, an agency may provide either a quantifiable or numerical description of the effects of a proposed rule or alternatives to the proposed rule, or more general descriptive statements if quantification is not practicable or reliable. The RFA requires the agency to publish the IRFA or a summary of the IRFA in the Federal Register at the time of the publication of general notice of proposed rulemaking for the rule.[16]

Pursuant to section 605(a), an agency may prepare a certification in lieu of an IRFA if the head of the agency certifies that the proposed rule will not have a significant economic impact on a substantial number of small entities. A certification must be supported by a factual basis. In this particular rulemaking, EPA determined that a regulatory flexibility analysis was not necessary.

II. Analytical Monitoring

In their current form, the MSGP analytical monitoring requirements may be too costly and burdensome for the incremental information they provide. The Office of Advocacy commends EPA for soliciting comment on analytical monitoring and hopes the attached Technical Memorandum provides valuable information and data to assist EPA's study.

In the proposed 2006 MSGP, EPA states its intention to conduct further analysis to support development of the 2010 MSGP. The analysis is expected to evaluate the usefulness of the monitoring data to the permittee or permitting authority in determining the adequacy of the Stormwater Pollution Prevention Plan or the potential for water

[15] 70 Fed. Reg. 72118.
[16] 5 USC §603.

quality standards exceedances. As part of this effort, EPA asserts that it will evaluate the extent to which benchmark exceedances correlate with determinations that corrective action or additional measures to address water quality are needed. Advocacy strongly supports EPA's plan to conduct these critical analyses.[17]

The attached Technical Memorandum details several shortcomings of analytical monitoring. The Office of Advocacy does not necessarily endorse the Technical Memorandum's policy recommendation that monitoring be suspended pending the evaluation of EPA-sponsored analysis. However, we hope that EPA recognizes that the 2006 MSGP will be imposing burdensome requirements on approximately 60,000 small facilities. And, according to the attached Technical Memorandum, those analytical monitoring requirements have limited practical utility.

Please feel free to contact me or Kevin Bromberg in my office if we can answer questions that may be prompted by this correspondence. We look forward to working with you on issues like the Multi-Sector General Permit for Industrial Facilities that benefit from a dialogue between small entities and EPA.

Sincerely,

Thomas M. Sullivan
Chief Counsel for Advocacy

Kevin Bromberg
Assistant Chief Counsel

Enclosure:

Technical Memorandum, Prepared by E.H. Pechan & Associates, Inc., "Analysis of Multi-Sector General Permit (MSGP) Stormwater Discharge Monitoring Requirements, Technical Memorandum," (March 2006).

cc:
Donald Arbuckle, Acting Administrator, Office of Information and Regulatory Affairs, OMB

[17] Possible suggestions for new analyses of the 2006 MSGP monitoring data (post-MSGP promulgation) are addressed in more detail in the Technical Memorandum.

ANALYSIS OF MULTI-SECTOR GENERAL PERMIT (MSGP) STORMWATER DISCHARGE MONITORING REQUIREMENTS

TECHNICAL MEMORANDUM

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March 2006

Work Assignment No. 04-7

The Office of Advocacy, an independent office within the U.S. Small Business Administration, has primary responsibility for government-wide oversight of the Regulatory Flexibility Act of 1980 (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA). The principal goal of the RFA is to identify, and, if possible, lessen the burdens Federal regulations place on small entities. The Office of Advocacy sponsored this report under contract SBAHQ-03C0020. The statements, findings, conclusions, and recommendations found in this report are those of the authors and do not necessarily reflect official policies of the Office of Advocacy, the U.S. Small Business Administration, or the U.S. Government.

CONTENTS

Page

I. OVERVIEW 1
A. MSGP REGULATORY BACKGROUND 1
B. PURPOSE AND SUMMARY OF RECOMMENDATIONS 3
C. DOCUMENT ORGANIZATION 3

II. SUMMARY OF 2000 MSGP MONITORING REQUIREMENTS AND ANALYSIS OF DRAFT PROPOSED 2006 MSGP MONITORING REQUIREMENTS 5
A. 2000 MSGP MONITORING REQUIREMENTS 5
1. Visual Monitoring 5
2. Analytical Monitoring 6
a. Identification of Benchmark Concentrations 7
b. Application of Benchmarks to Industry Sectors 9
B. 2006 MSGP 10
1. Summary of Major Monitoring Requirement Changes from 2000 MSGP 10
a. Monitoring Schedule 10
b. Revisions to Benchmark Requirements 11
2. Shortcomings of 2006 MSGP Analytical Monitoring 16
a. Benchmark Concentrations Equate Discharge With Receiving Waters 16
b. Sampling Protocol Is Insufficient for Determining Benchmark Compliance 16
c. Current Benchmark Sampling Requirements Are Insufficient for Determining SWPPP Effectiveness 18
d. Questionable Data Used to Identify Sectors/Pollutants of Concern and to Support Determination of Benchmark Achievability 20
3. Cost Burden of 2006 MSGP Analytical Monitoring Requirements 21

III. RECOMMENDATIONS FOR IMPROVING EPA APPROACH TO MSGP MONITORING 22
A. REVISIONS TO PROPOSED 2006 MSGP 22
B. IMPROVEMENTS FOR 2010 MSGP 23
1. Use of 2006 MSGP Analytical Monitoring Data in Future Study 24
2. Comprehensive Information to Improve MSGP Approach to Evaluating SWPPP Element Effectiveness 24
3. Potential Alternatives to Analytical Monitoring 25

IV. REFERENCES 27

TABLES
1. Proposed Revisions to Pollutant Benchmark Levels 13
2. Benchmark Revisions with Analytic Test Method Changes 14

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I. OVERVIEW

A. MSGP REGULATORY BACKGROUND[1]

In 1972, the Federal Water Pollution Control Act (also referred to as the Clean Water Act [CWA]) was amended to provide that the discharge of any pollutant to waters of the United States from any point source is unlawful, except if the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. Congress added section 402(p) to the CWA in 1987 to establish a comprehensive framework for addressing stormwater discharges under the NPDES program. Section 402(p)(4) of the CWA clarifies the requirements for EPA to issue NPDES permits for stormwater discharges associated with industrial activity. EPA subsequently published regulations which defined the term "stormwater discharge associated with industrial activity" (55 FR 47990, November 16, 1990; as amended at 56 FR 12100, Mar. 21, 1991; 56 FR 56554, Nov. 5, 1991; 57 FR 11412, Apr. 2, 1992; 57 FR 60447, Dec. 18, 1992).

The regulations presented three permit application options for stormwater discharges associated with industrial activity. The first option was to submit an individual application. The second option was to become a participant in a group application. The third option was coverage under a general permit in accordance with the requirements of an issued general permit. Group applications were submitted in two parts. Part 1 of the application was due by September 30, 1991, and part 2 of the application was due by October 1, 1992. In part 1 of the application, all participants were identified and information on each facility was included, such as industrial activities, significant materials exposed to stormwater, and material management activities. For part 1 of the application, groups also identified sampling subgroups to submit sampling data for part 2. Over 1,200 groups with over 60,000 member facilities submitted part 1 applications. Upon review of the part 1 application, if the EPA determined that the application was an appropriate grouping of facilities with complete information provided on each participant, and a suitable sampling subgroup was proposed, the application was approved. In 1995, EPA estimated that about 100,000 facilities nationwide discharge stormwater associated with industrial activity (not including oil and gas exploration and production operations) as described under phase I of the stormwater program (60 FR 50804, 1995).

Part 2 of the application consisted of sampling data from each member of the sampling subgroup identified in part 1 of the application. In drafting the first multi-sector general permit (MSGP), EPA reviewed both parts of the applications and formulated permit language that was promulgated in 1995 (60 FR 50804, 1995). In this 1995 MSGP, authorized NPDES States were provided the data from the group applications. Authorized NPDES States were allowed to propose and finalize either individual permits for each facility included in the application located in the State, or general permits, if the State had general permit authority.

To facilitate the process of developing permit conditions for each of the 1,200 group applications submitted, in 1995 EPA classified groups into 29 industrial sectors where the nature of industrial activity, type of materials handled and material management practices employed were sufficiently similar for the purposes of developing permit conditions. Each of the industrial

[1] This section has been adapted from a discussion presented in the 1995 MSGP (60 FR 50804, 1995).

sectors were represented by one or more groups which participated in the group application process. The EPA also further divided some of the 29 sectors into subsectors in order to establish more specific and appropriate permit conditions, including best management practices and monitoring requirements.

All facilities covered by the MSGP must prepare and implement a stormwater pollution prevention plan (SWPPP). The stormwater permit addresses pollution prevention plan requirements for a number of categories of industries. As noted in the 1995 MSGP:

> *The stormwater pollution prevention plan requirements in the general permit are intended to facilitate a process whereby the operator of the industrial facility thoroughly evaluates potential pollution sources at the site and selects and implements appropriate measures designed to prevent or control the discharge of pollutants in stormwater runoff. The process involves the following four steps: (1) Formation of a team of qualified plant personnel who will be responsible for preparing the plan and assisting the plant manager in its implementation; (2) assessment of potential stormwater pollution sources; (3) selection and implementation of appropriate management practices and controls; and (4) periodic evaluation of the effectiveness of the plan to prevent stormwater contamination and comply with the terms and conditions of this permit* [pp. 50814-5].

The MSGP currently authorizes stormwater discharges associated with industrial activity for most areas of the United States that are not authorized to administer the NPDES permit program. The initial MSGP was issued on September 29, 1995 (60 FR 50804), and subsequently amended numerous times. The current MSGP (referred herein as 2000 MSGP) was issued on October 30, 2000 (65 FR 64746), and was subsequently corrected on January 9, 2001 (66 FR 1675) and March 23, 2001 (66 FR 16233). On April 16, 2001 (66 FR 19483) EPA re-issued the permit, as corrected, for facilities in certain areas of Regions 8 and 10.

In developing the 2000 MSGP, EPA re-evaluated the industry-specific requirements of the MSGP. In a few instances, additional requirements were included based on new information that had been obtained since the 1995 MSGP was promulgated. These changes, which are not the subject of this memorandum, are discussed in detail in the 2000 MSGP (65 FR 64746).

The EPA also re-evaluated the stormwater discharge monitoring requirements of the MSGP. However, after review of the comments received from the public, and the monitoring data received during the term of the 1995 MSGP, EPA decided to retain the same monitoring requirements for the reissued MSGP as those incorporated into the 1995 MSGP. Section II.A. of this document provides a discussion of the current (2000 MSGP) EPA requirements for visual and analytical monitoring.

B. PURPOSE AND SUMMARY OF RECOMMENDATIONS

The purpose of this report is to describe and evaluate the analytical monitoring requirements associated with the proposed 2006 MSGP and to develop recommendations to assist EPA in designing a study to address the shortcomings of EPA's general permit approach for regulating stormwater from industrial activities.

In the proposed 2006 MSGP, EPA requests comment on whether analytical monitoring exceedances are a useful indicator of the need for revisions to the SWPPP and whether other approaches would be effective in ensuring that SWPPPs are properly designed and implemented. Although the goals of analytical monitoring under the proposed 2006 MSGP are worthy, the requirements should not be retained because the following serious shortcomings can not be fully addressed in time for this permit cycle:

(1) The setting of current benchmark levels is based on insufficient data – the setting process does not account for background pollutant levels; equates stormwater discharges to receiving waters (e.g., does not account for mixing); and does not properly address whether levels are realistically achievable;

(2) The current sampling protocol is arbitrary/not scientifically supportable – the sampling protocol should better reflect the correlation between water quality-based benchmarks and mass event load; the current first 30 minute discharge sampling is arbitrary and provides worst case values that result in continuation of overly burdensome requirements for SWPPP review and analytical monitoring;

(3) EPA acknowledges that it does not have any evidence that MSGP benchmark monitoring is sufficiently robust to evaluate SWPPP/BMP performance:

(4) The data EPA used to identify industry sectors/pollutants of concern and benchmark achievability are not sufficient for these determinations.

Given the concerns raised above, EPA should eliminate the analytical monitoring requirements until such time that the burden of benchmark monitoring can be justified relative to the information that it may provide for evaluating SWPPP effectiveness. In place of the 2006 MSGP's burdensome analytical monitoring requirements, EPA should utilize visual monitoring, which provides important feedback to facility operators on the effectiveness of their SWPPPs at much lower cost. In addition, if practicable, EPA should consider revising the sampling protocol to require that visual examinations occur during representative storm events, and from either multiple periods during each storm event, or for a single time period that is determined to be more representative of mean pollutant concentrations than the first 30 minutes of discharge.

C. DOCUMENT ORGANIZATION

Section II of this document summarizes the visual and analytical monitoring requirements of the current (2000) MSGP, and analyzes the changes to these requirements as identified in EPA's fact sheet for the proposed 2006 MSGP (EPA, 2005a).

Section III of this memorandum describes recommendations for revisions to the monitoring requirements of the proposed 2006 MSGP, and identifies the information that EPA should seek to gather to improve MSGP monitoring in time for the next (2010 MSGP) permit cycle.

Section IV of this document identifies the references that were consulted in preparing this memorandum.

II. SUMMARY OF 2000 MSGP MONITORING REQUIREMENTS AND ANALYSIS OF DRAFT PROPOSED 2006 MSGP MONITORING REQUIREMENTS

This Section is divided into two major subsections. The first subsection summarizes the monitoring requirements of the previous (2000) MSGP. This is followed by a subsection that describes the proposed 2006 MSGP revisions to these requirements. This subsection identifies shortcomings with the proposed analytical monitoring requirements, and presents estimates of the total costs of the 2006 MSGP analytical monitoring requirements.

A. 2000 MSGP MONITORING REQUIREMENTS

The MSGP contains three general types of stormwater discharge monitoring requirements: (1) visual examinations; (2) analytical (chemical) monitoring; and (3) compliance monitoring for effluent guidelines. As requested by the SBA's Office of Advocacy, this memorandum focuses on the MSGP's analytical monitoring requirements.

The 2000 MSGP required that all industry sectors perform visual examinations of their stormwater discharges on a quarterly basis throughout the permit's duration. In the 1995 MSGP, all sectors except Sector S (which covers air transportation) were required to conduct these examinations. Visual examinations of stormwater discharges are the least burdensome type of monitoring required under the MSGP.

The 2000 MSGP also required laboratory chemical analyses of stormwater discharge samples collected by the permittee. The results of the analytical monitoring are quantitative concentration values for different pollutants, which can be compared to the results from other sampling events, other facilities, or to National benchmarks. In general, the 2000 MSGP required quarterly analytical monitoring in years two and four of the permit period.

As noted in the 2000 MSGP and associated monitoring guidance, all visual and analytical monitoring samples were required to be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event.[2]

1. Visual Monitoring

The current MSGP required the collection of quarterly grab samples, and that these samples be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff/snowmelt begins. The MSGP required that the visual examination of the sample include observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and "other obvious indicators" of stormwater pollution. EPA required

[2] The 72-hour storm interval was waived when the preceding measurable storm did not yield a measurable discharge, or if the facility could document that less than a 72-hour interval is representative for local storm events during the sampling period.

that documentation of the visual examination report the following: examination date and time, examination personnel, visual quality of the stormwater discharge, and probable sources of any observed stormwater contamination. The visual examination reports were to be maintained on-site with the SWPPP.

The 2000 MSGP noted that the results of a stormwater visual examination should be related to potential sources of stormwater contamination on the site. For example, if the visual examination revealed an oil sheen, then the examiner was to conduct an inspection of the area of the site to look for sources of spilled oil, leaks, etc. Similarly, if floating solids were identified in the visual examination, then the solids should be examined to see if they are raw materials, waste materials, or other known products stored or used at the site. If an unusual color or odor was observed, then the color or odor was to be compared to the colors or odors of known chemicals and other materials used at the facility. Although EPA asserted that a clear stormwater sample is indicative of a lack of visible pollutants:

> *...the visual examination will not provide information about dissolved contamination. ...the results of the chemical monitoring...would help to identify the presence of any dissolved pollutants and the ultimate effectiveness of the Storm Water Pollution Prevention Plan.* (pg. 64773 of 2000 MSGP)

The proposed 2006 MSGP emphasizes that the goal of sampling is to capture meaningful data regarding the effectiveness of best management practices (BMPs) and the SWPPP, rather than to characterize the temporal variability of the stormwater discharge.[3]

2. Analytical Monitoring

Analytical monitoring measures the concentration of a pollutant in a stormwater discharge. Because analytical results are quantitative, they can be used to compare concentrations between discharges, and therefore, to possibly quantify the improvement in stormwater quality attributable to a SWPPP. Such monitoring may similarly be used to identify that a pollutant is not being successfully controlled by the plan. EPA has clearly stated that analytical monitoring results are primarily for use by the facility in determining the overall effectiveness of their SWPPP in controlling pollutant discharge to receiving waters. Although EPA has set "benchmark" concentrations, and requires that monitoring results be compared with these benchmarks, such monitoring is not to be used for determining compliance with effluent limits:

> *An exceedance of a benchmark value does not, in and of itself, constitute a violation of the permit. While exceedance of a benchmark value does not automatically indicate that violation of a water quality standard has occurred, it does signal that modifications to the SWPPP may be necessary.* (pg. 64816 of 2000 MSGP)

Unless otherwise specified, the 2000 MSGP required analytical monitoring in each quarter between October, 2001 and September 30, 2002 (year two of the permit) and between October 1,

[3] BMPs are processes, procedures, schedules of activities, prohibitions on practices, vegetation, installed devices, structures, and other management practices that prevent or minimize pollutants in stormwater discharges.

2003 and September 30, 2004 (year four of the permit). Facilities were not required to conduct year four benchmark monitoring for a given pollutant/outfall provided: (1) they collected samples for all four quarters of the 2001–2002 monitoring year and the average concentration was below the benchmark value; (2) they were not subject to a numeric limitation or State/Tribal-specific monitoring requirement for that parameter; and (3) they included a certification in the SWPPP that based on current potential pollutant sources and BMPs, discharges from the facility are reasonably expected to be essentially the same (or cleaner) when compared to the year two benchmark monitoring. If year four's analytical monitoring results were still above benchmark concentrations, the 2000 MSGP required that the SWPPP again be reviewed, and, if necessary, revised in an attempt to reduce pollutant loads.

The 2000 MSGP required that permittees submit all analytical monitoring results obtained during the second and fourth year of permit coverage within three months of the conclusion of the second and fourth year of permit coverage. One Discharge Monitoring Report (DMR) was required for each outfall and storm event sampled.

a. Identification of Benchmark Concentrations

To determine when analytical monitoring would be required under the MSGP, EPA first established "benchmark" pollutant concentrations. The EPA has described these benchmarks as the pollutant concentrations that, when exceeded, represent a "level of concern," where level of concern is defined as the "...concentration at which a stormwater discharge could potentially impair, or contribute to impairing water quality or affect human health from ingestion of water or fish" (65 FR 64746, 2000 MSGP at page 64766). In the 2000 MSGP, EPA also asserted that the benchmarks provide information for determining whether a facility's SWPPP is implemented successfully:

> *These values are merely levels which EPA has used to determine if a stormwater discharge from any given facility merits further monitoring to insure that the facility has been successful in implementing a stormwater pollution prevention plan. As such these levels represent a target concentration for a facility to achieve through implementation of pollution prevention measures at the facility.* (65 FR 64767 of 2000 MSGP)

The existing benchmark concentrations are often based on water quality standards, although EPA also stated that they sought to identify values that can realistically be measured and achieved by industrial facilities. The primary source of the MSGP benchmarks was EPA's National Water Quality Criteria, published in 1986 (often referred to as the "Gold Book"). For the majority of the benchmarks, EPA chose to use the acute aquatic life, freshwater ambient water quality criteria. These criteria represent maximum pollutant concentration values, which when exceeded, could cause acute effects on aquatic life in a short time period. Where acute aquatic criteria values were not available, EPA used the lowest observed effect level (LOEL) acute freshwater value. The LOEL values represent the lowest concentration of a pollutant that results in an adverse effect over a short period of time. These two acute freshwater values were selected as benchmark concentrations if the value was not below the approved method detection limit as listed in 40 CFR Part 136 and the value was not substantially above the concentration that EPA believes a facility can attain through SWPPP implementation.

Because acute freshwater criteria did not exist for a number of parameters on which EPA received group permit application data, EPA also selected benchmark values from other sources, including:

(1) The benchmark concentrations for five day biochemical oxygen demand (BOD5) and for pH were based upon secondary wastewater treatment regulations (40 CFR 133.102). The benchmark value for pH is a range of 6.0–9.0 standard units. EPA stated that it believed that this level is both reasonably achievable by industrial stormwater dischargers (given the group application data), and an acceptable range within which aquatic life impacts will not occur.

(2) The benchmark concentration for chemical oxygen demand (COD) was based upon the State of North Carolina benchmark values for stormwater discharges, and is a factor of four times the BOD5 benchmark concentration. EPA concluded that COD is generally discharged in domestic wastewater at four times the concentration of BOD5 without causing adverse impacts on aquatic life.

(3) EPA selected the median concentration from the National Urban Runoff Program as the benchmark for total suspended solids (TSS) and for nitrate plus nitrite as nitrogen, using the rationale that water quality concerns may result from exceeding the median observed level.

(4) EPA selected the stormwater effluent limitation guideline for petroleum refining facilities as the benchmark for oil and grease.

(5) EPA selected the chronic freshwater quality criteria as the benchmark for iron because of the lack of acute criteria.

(6) Water quality criteria for waterbodies in the State of North Carolina were used to determine benchmarks for total phosphorus and for fluoride. The manganese value was designed by Colorado to be protective of water quality. (pg. 50825 of 1995 MSGP)

For several other parameters, EPA chose a benchmark value based on a numerical adjustment to the acute freshwater quality criteria. Where the acute water quality criteria was below the method detection level (MDL) for a pollutant, EPA used the "minimum level" (ML) as the benchmark concentration to ensure that facilities could measure the benchmark levels. EPA calculates the ML by multiplying the highest MDL by a factor of 3.18 (pg. 50825 of 1995 MSGP).

Because several organic compounds (ethylbenzene, fluoranthene, toluene, and trichloroethylene) have acute freshwater quality criteria at concentrations that are much higher than criteria developed for the protection of human health from water or fish ingestion (also, trichloroethylene is a human carcinogen), EPA selected the human health criteria as benchmarks for these

parameters. For dimethyl phthalate and total phenols, EPA selected benchmark concentrations based upon existing discharge limitations and compliance data.[4]

b. Application of Benchmarks to Industry Sectors

To determine the industry sectors/subsectors that would be subject to the 1995 MSGP analytical monitoring requirements, EPA analyzed monitoring data that were submitted in the group application process. First, EPA divided the Part 1 and Part 2 application data by industry sector. When a sector was found to contain a wide range of industrial activities or potential pollutant sources, EPA further subdivided the data by industry subsector.

Next, EPA reviewed the Part 1 group application data to identify industrial activities, significant materials exposed to stormwater, and measures used to manage these materials. This information was used to assist in identifying pollutants that may be in the stormwater discharges. To assist in identifying the sectors/subsectors for which EPA would require analytical (benchmark) monitoring, EPA entered the Part 2 group application sampling data into a database and performed statistical analyses. A preliminary determination of monitoring applicability was made when the median concentration of the sampling data exceeded the benchmark. To ensure that a reasonable number of facilities represented the industry sector or subsector, EPA did not perform this analysis if a sector had pollutant sampling data from less than three facilities. For these instances, EPA excluded the pollutant from the list of pollutants of concern for the sector/subsector, effectively excluding the sector from MSGP analytical monitoring requirements for the pollutant.

Next, EPA compared the list of potential pollutants to be monitored for each sector/subsector against the lists of significant materials exposed and industrial activities which occur within each industry sector/subsector as described in the Part 1 application information. Where EPA was able to identify a source of a pollutant that was directly related to the industrial activities of a industry sector/subsector, the MSGP identified the pollutant for analytical monitoring. If EPA could not identify a source of a pollutant that was associated with the sector/subsector's industrial activity, the MSGP did not require that the sector/subsector monitor for that pollutant. Except as noted below, analytical monitoring was not required for sectors/subsectors for which all pollutants' median concentrations were lower than benchmark levels.

In addition, the 1995 and 2000 MSGP applied analytical monitoring requirements to hazardous waste treatment storage and disposal facilities, and airports that use more than 100,000 gallons per year of glycol-based fluids or 100 tons of urea for deicing. These industries were required to perform analytical monitoring due to an EPA determination of a high potential for stormwater discharge contamination that it asserted to be inadequately characterized by the information provided in the group application process.

As part of the reissuance process for the 2000 MSGP, EPA evaluated the analytical monitoring conducted during the second and fourth year of the 1995 MSGP. Specifically, EPA reviewed the DMRs submitted over the course of the 1995 MSGP. One factor that was identified as common

[4] Note, however, that no industries provided group application data indicating industry median concentrations above the selected benchmarks. Therefore, no industry sector was required to monitor for these two pollutants.

to almost all industrial sectors, was that the number of DMRs submitted for the year four monitoring period far exceeded the number of DMRs submitted for the year two monitoring period. Overall, there were more than triple the number of DMRs submitted in year four versus the number submitted in year two.[5] As a result, EPA decided not to perform trends analyses on the monitoring results. In reissuing the MSGP in 2000, EPA concluded that the limitations of the available DMR information precluded a consideration of dropping the MSGP's analytical monitoring requirements. However, in the 2000 MSGP, EPA committed to using 1995 and 2000 MSGP monitoring data "...to evaluate the effectiveness of management practices on an industry sector basis and to evaluate the need for changes in monitoring protocols for the next permit."

B. 2006 MSGP

1. Summary of Major Monitoring Requirement Changes from 2000 MSGP

For the most part, EPA's proposed 2006 MSGP does not change the basic framework for analytical monitoring established in the 2000 MSGP. This section highlights the changes to the analytical monitoring requirements of the MSGP as outlined in the fact sheet for the proposed 2006 MSGP (EPA, 2005a). In addition to revisions to the monitoring schedule, the benchmark pollutant concentrations, and the sector/subsector applicability of benchmarks, which are described below, EPA is also proposing that inactive and unstaffed sites may exercise a benchmark waiver as long as there are no exposed industrial materials or activities. The proposed 2006 MSGP also requires application of a number of sector-specific BMPs (Part 4), and requires all operators to implement certain types of BMPs (Part 2.1.5). Each operator is required to design effective controls for the relevant set of pollutants, operations and site conditions. Failure to adequately design, implement or maintain appropriate BMPs is considered a violation of the permit.

a. Monitoring Schedule

Under the 2000 MSGP, permittees did not begin analytical monitoring until the second year of permit coverage. Based on an evaluation of the 2000 MSGP discharge monitoring data, EPA asserts that a number of pollutant discharge problems went unrecognized for over a year. Therefore EPA is revising the MSGP to require that analytical monitoring begin in the first quarter of permit coverage.

In the 2000 MSGP, quarterly benchmark monitoring was required in year four when the average of the year two monitoring exceeded benchmark levels. In the proposed 2006 MSGP, additional analytical monitoring is required in year two when the average of the year one monitoring (i.e., average of the four quarterly monitoring event values from year one) exceeds benchmark levels. A benchmark exceedance immediately triggers a requirement to review the SWPPP to determine whether it includes all appropriate BMPs to eliminate or reduce the pollutant of concern. Where the operator determines that the SWPPP does not meet Part 2 permit requirements, they must

[5] Although EPA was unsure of the cause for the significant increase in DMRs, they suspected that it was related to the administrative extension of the 1992 baseline general permit. This extension resulted in EPA not requiring 1995 MSGP analytical monitoring until December 28, 1998 for facilities that were previously covered under the baseline industrial permit.

modify the SWPPP within 14 days and implement revised BMPs before the next rainfall event if possible, but in no case later than 60 days, (unless otherwise provided by EPA). An additional four quarters of monitoring must take place in the second year of permit coverage if the facility operator determines that SWPPP modifications are necessary. Such monitoring is required after corrective actions have been implemented to ensure that corrective actions are effective.[6]

The MSGP acknowledges that in some instances modifications to the SWPPP and BMPs are not warranted. If the permittee determines that no changes to the SWPPP are needed, then this must be documented in the SWPPP. EPA identifies the presence of high background pollutant levels and application of all economically reasonable and appropriate BMPs as instances when revisions would not be required. To address such situations, the proposed 2006 MSGP allows permittees, following a review of their SWPPP, to determine that they are implementing all reasonable and appropriate BMPs to reduce pollutants in the discharge, and to document in the SWPPP the basis for this determination. Following the permittee's determination that the SWPPP is adequate, EPA permits benchmark monitoring to be reduced to once per year for the balance of the permit term.

In addition, the proposed 2006 MSGP would require that DMRs be submitted to EPA no later than 30 days after all analytical data from a monitoring event are received. This represents a change from MSGP 2000, where operators could submit results of multiple monitoring events once per year.

b. Revisions to Benchmark Requirements

In the 2006 MSGP, EPA notes that it conducted a review of MSGP analytical monitoring requirements that included a determination if available data supported elimination of, or revisions to, one or more benchmarks. This review included an analysis of DMR data, Toxics Release Inventory (TRI) data, and the results and conclusions cited in the University of California, Los Angeles (UCLA) Final Report, *Industrial Storm Water Monitoring Program Existing Statewide Permit Utility and Proposed Modifications*.

EPA's analysis of DMR data is available in the MSGP docket (see memorandum titled "Review of Discharge Monitoring Report Data for the MSGP 2000.") Although EPA acknowledges that the monitoring data indicate that many facilities report routine exceedances of benchmark values, they also assert that "EPA has not yet been able to complete this analysis to determine whether these exceedances provide useful indicators of SWPPP inadequacies or potential water quality problems." Although it appears that EPA is suggesting that they did not have sufficient time to analyze the current data, it is more likely that the data are inadequate for making these determinations. In particular, there is no information on the specific SWPPP/BMP activities that are associated with the monitoring data. However, EPA states their intention to conduct further analysis in support of the development of the 2010 MSGP. These analyses would be used "...to

[6] EPA emphasizes that even though a benchmark exceedance itself is not a permit violation, failure to review the SWPPP, and take necessary corrective actions determined by the SWPPP review within the stipulated time frames is a violation. In addition, an exceedance may be indicative of other permit violations, such as failure to adequately maintain BMPs.

evaluate the usefulness of the monitoring data... in determining the adequacy of the SWPPP or the potential for water quality standards exceedances." Furthermore, EPA states that such analyses "...will assess the extent to which benchmark exceedances correlate with determinations that corrective action or additional measures to address water quality are needed." (pg. 39 of EPA, 2005a)

Revisions to Benchmark Levels EPA asserts that it was prepared to drop any benchmark monitoring requirement where data indicated that a pollutant was not present, or occurred at such consistently low levels that monitoring would provide no value in indicating discharge quality. As described below, however, EPA concluded that additional analytical monitoring benchmarks were also needed.

Benchmark values are based primarily on water quality criteria. In the 1995 and 2000 MSGP, where an applicable water quality criterion was below the minimum level (ML) of quantification for the most sensitive available analytic method, EPA used a value equal to 3.18 times the method detection limit (MDL) for that pollutant in lieu of the water quality criterion. For the 2006 MSGP, the number of such pollutants has been reduced from 12 to 2 (magnesium and total phenols).

Where there are no established EPA water quality criteria, EPA used other data sources to determine the appropriate benchmark value. The process that EPA followed in selecting the benchmark values for the 2006 MSGP is as follows:

1) If there was an EPA promulgated acute criterion, then EPA selected that value for the benchmark;

2) If there was no EPA acute criterion, then EPA selected the chronic criterion as the benchmark value;

3) In the remaining few instances where there were neither EPA acute or chronic criteria available for a specific pollutant, EPA selected the benchmark value based on data from runoff studies or technology-based standards.

With the exception of removal of the manganese benchmark, Table 1 displays the pollutants for which EPA is proposing revisions to existing benchmark levels. Benchmark levels of nine pollutants (arsenic, cadmium, copper, cyanide, lead, mercury, nickel, selenium, and silver) have been revised to reflect switching from an MDL to an ambient water quality criterion, or to reflect a revised water quality criterion. The values for four pollutants (antimony, lead, magnesium, and zinc) have been rounded to two significant figures. The 2006 MSGP would revise the existing turbidity benchmark (5 NTU above background) to 50 NTU. While the existing turbidity standard requires the permittee to monitor both the discharge and the receiving stream, the proposed new benchmark would only require monitoring of the discharge.

Table 1. Proposed Revisions to Pollutant Benchmark Levels

Pollutant	2000 MSGP Benchmark (mg/L unless otherwise noted)	2000 MSGP Source	2006 MSGP Benchmark (mg/L unless otherwise noted)	2006 MSGP Source	Different basis?
Turbidity	5 NTU above background	13	50 NTU	9	Yes
Antimony, Total	0.636	8	0.64	12	Yes
Arsenic, Total	0.16854	8	0.15	3	Yes
Cadmium, Total[#]	0.0159	8	0.0021	1	Yes
Chromium, Total[#]	N/A	N/A	1.8	1	New
Copper, Total[*#]	0.0636	8	0.014	1	Yes
Cyanide, Total	0.0636	8	0.022	1	Yes
Lead, Total[*#]	0.0816	10	0.082	1	No
Magnesium, Total	0.0636	8	0.064	8	No
Mercury, Total	0.0024	10	0.0014	1	(Criteria updated)
Nickel, Total[#]	1.417	10	0.47	1	(Criteria updated)
Phenols, Total	N/A	N/A	0.016	8	New
Selenium, Total[*]	0.2385	8	0.005	3	Yes
Silver, Total[*#]	0.0318	8	0.0038	1	Yes
Zinc, Total[#]	0.117	10	0.12	1	(Criteria updated)

N/A Not applicable

* New criteria are currently under development, but values are based on existing criteria.

\# These pollutants are dependent on water hardness. The benchmark value listed is based on a hardness of 100 mg/L. If you analyze your water samples for hardness, then an alternate benchmark may apply if you use the equations provided in Part 4.

1 "EPA Recommended Ambient Water Quality Criteria." Acute Aquatic Life Freshwater (EPA-822-R-02-047 November 2002-CMC).

3 "EPA-Recommended Ambient Water Quality Criteria." Chronic Aquatic Life Freshwater (EPA-822-R-02-047 November 2002-CCC).

8 Minimum Level (ML) based upon highest Method Detection Limit (MDL) times a factor of 3.18.

9 Combination of simplified variations on Stormwater Effects Handbook, Burton and Pitt, 2001 and water quality standards in Idaho, in conjunction with review of DMR data.

10 "EPA Recommended Ambient Water Quality Criteria." Acute Aquatic Life Freshwater. This is an earlier version of the criteria document that has subsequently been updated. (See source #1).

12 "EPA Recommended Ambient Water Quality Criteria." Human Health For the Consumption of Organism Only (EPA-822-R-02-047 November 2002).

13 Consistent with many state numeric Water Quality Criteria. This benchmark was agreed to in negotiations for the 1998 modification to the 1995 MSGP (63 FR 42534).

In most cases, benchmarks have not been significantly revised. However, six of the pollutants (cadmium, copper, cyanide, selenium, silver, and nickel) have benchmark values based on EPA water quality criteria that are lower than the previous values. For the first five of these, the values have been changed from 3.18 times the minimum detection level for a particular analytic method, to ambient water quality criteria.

As identified in Table 2 below, some of the proposed benchmark revisions are associated with analytic test cost increases of between $2 (20 percent) and $10 (100 percent) per sample. In the case of nickel, the acute water quality standard that formed the basis of the previous benchmark was revised downward in 1996, but the lower benchmark will not require use of a new analytic method.

Table 2. Benchmark Revisions with Analytic Test Method Changes

	2000 MSGP Analytic Method			2006 MSGP Analytic Method		
Pollutant	Method ID	MDL (ug/L)	$/sample	Method ID	MDL (ug/L)	$/sample
Cadmium	200.7	4	10	200.8	0.5	12
Copper	220.1	20	20	200.8	0.09	12
Cyanide	335.2	20	40	335.3	4	40
Selenium	200.7	75	10	270.2	2	20
Silver	272.1	10	20	200.8	0.11	12

MDL - minimum detection level.

Revisions to Sector Benchmark Applicability. EPA is also proposing the following sector-specific revisions to the 2000 MSGP benchmark requirements:

- The addition of benchmark requirements for Total Suspended Solids (TSS) for each MSGP sector where they were not previously required;
- The addition of Total Recoverable Chromium and Phenols as benchmark parameters for the Wood Preserving (SIC code 2491) subsector of Sector A–Timber Products;
- The removal of Total Recoverable Manganese as a benchmark parameter for Waste Rock and Overburden Piles from Active Ore Mining or Dressing Facilities under Sector G–Metal Mining (Ore Mining and Dressing);
- The addition of Total Recoverable Lead, Total Recoverable Nickel, Total Recoverable Zinc, Ammonia Nitrogen, and Nitrate + Nitrate Nitrogen as a benchmark parameter for the Oil Refining (SIC code 2911) subsector of Sector I–Oil and Gas Extraction and Refining;
- The addition of Total Recoverable Lead as a benchmark monitoring parameter for the Tires and Inner Tubes; Rubber Footwear; Gaskets, Packing, and Sealing Devices; Rubber Hose and Belting; and Fabricated Rubber Products, Not

Elsewhere Classified (SIC codes 3011-3069, only Rubber Manufacturing) subsector of Sector Y–Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries; and

- The addition of Total Recoverable Lead and Total Recoverable Copper as benchmark parameters for the Electronic and Electrical Equipment and Components Except Computers (SIC codes 3512-3699) subsector of Sector AC–Electronic, Electrical, Photographic, and Optical Goods Sector.

EPA is proposing to expand application of the total suspended solids (TSS) benchmark (100 mg/L), which applies to a number of sectors under MSGP 2000, to all 2006 MSGP sectors. EPA asserts that TSS is a reasonable screen or indicator of stormwater discharge quality because many stormwater pollutants are themselves suspended solids, or enter receiving waters attached to solids. EPA also asserts that TSS is a relatively inexpensive parameter to measure, and that TSS data are not difficult to interpret in terms of providing an indication of BMP effectiveness.

EPA also notes that a review of TRI data indicated that the wood preservation subsector (SIC 2491) of Sector A (Timber Products) appeared to be missing some key parameters. New proposed benchmarks for the wood preserving subsector are chromium, which is targeted for potential chromated copper arsenate (CCA)-treated wood storage, and phenols, which is an indicator for pentachlorophenol (PCP) and methyl phenols. Rather than monitor for PCP directly (which is an expensive approach), EPA decided to use phenols as an indicator. This indicator benchmark targets the current recommended water quality standard of 0.019 mg/L for pentachlorophenol ("EPA-Recommended Ambient Water Quality Criteria" Acute Aquatic Life Freshwater; EPA 822-R-02-047 November 2002).

EPA also suggests that the TRI data for Sector I (Oil and Gas Extraction and Refining) indicated that future monitoring is warranted for ammonia, lead, nickel, nitrate-nitrite, and zinc. EPA asserts that these pollutants appear at a frequency indicating that they are regularly handled at these facilities, and that they "...may pose an unacceptable risk for continued coverage under the MSGP without additional monitoring."

Based on TRI data for Sector Y (Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries), which indicated that 32 of 526 incidences of lead and lead compounds were reported discharged to stormwater, EPA is proposing to add monitoring requirements for lead for the following subsectors in Sector Y: Manufacture of Rubber Products: Tires and Inner Tubes; Rubber Footwear; Gaskets, Packing and Sealing Devices; Rubber Hoses and Belting; and Fabricated Rubber Products Not Elsewhere Classified.

For the Electronic and Electrical Equipment and Components Except Computers (SIC 3612-3699) subsector of Sector AC (Electronic, Electrical, Photographic, and Optical Goods), EPA is proposing new monitoring requirements for copper and lead. Copper and copper compounds, and lead and lead compounds were identified in the TRI data 872 and 1,848 times, respectively, with discharge to stormwater reported in 10 and 4.6 percent of these instances, respectively.

EPA decided against requiring monitoring for dioxins and dioxin-like compounds, primarily due to the costs associated with this type of monitoring ($700-$900 per sample). TRI data for dioxins and dioxin-like compounds were reported approximately 150 times between 1999 and 2002, and 25 of those included discharge to stormwater. EPA notes that it will revisit this issue for the 2010 MSGP.

2. Shortcomings of 2006 MSGP Analytical Monitoring

This section describes shortcomings of EPA's proposed MSGP analytical monitoring requirements. These shortcomings are substantial enough to indicate that EPA should eliminate the requirements until they can be properly addressed. In their current form, the MSGP analytical monitoring requirements are too burdensome for the incremental information they may provide relative to annual inspections and visual examinations. Pechan identifies an approach to addressing these shortcomings in Section III of this document.

a. Benchmark Concentrations Equate Discharge With Receiving Waters

As with previous MSGP's, EPA is generally proposing to rely on acute aquatic life freshwater quality criteria to identify the industrial sector discharge pollutant benchmarks. As such, most benchmarks reflect the application of receiving water standards to stormwater discharges. This approach ignores the ability of receiving water mixing/dilution to reduce potential water quality impacts. Although the benchmarks are not treated as effluent limitations, when sampling indicates that an average concentration is above benchmarks, EPA requires operators to re-evaluate their SWPPP, document this evaluation, and continue analytical monitoring. EPA's current approach is overly burdensome in that it may not be reasonable to set stormwater discharge benchmarks at levels that make the discharge habitable by aquatic life (or in the case of antimony, fit for human consumption). At a minimum, EPA chould acknowledge this by setting benchmarks above the levels that are meant to reflect receiving water concentrations.

b. Sampling Protocol Is Insufficient for Determining Benchmark Compliance

The MSGP requires that analytical monitoring grab sampling take place during the first 30 minutes of a discharge (or as soon as practicable, but no longer than 1 hour after the discharge begins). For most pollutants, the first 30 minutes of discharge will reflect "worst case" concentration levels due to a "first flush" phenomenon. As such, analytical monitoring is not representative of the total pollutant load or average pollutant concentration from the sampled storm event. Any one-time sample does not provide a true representation of the facility's discharge, and, therefore, is a poor approach to measuring true SWPPP effectiveness.

There are many variables that result in limitations from the current grab sample approach: the first flush phenomenon; variation in rainfall volume; intensity and duration; and the type of industrial activity that is occurring while sampling. The limitations of data generated by storm water grab samples are also compounded by variability in quality control in the field. If EPA wishes to use numeric benchmarks to determine SWPPP effectiveness, it would seem necessary to require flow-weighted composite samples, which better represent the overall storm event than a single grab sample, which is biased because of the collection time. It is not reasonable to

expect that a sample taken during the first flush of a storm event will fall within the parameters of acute aquatic life or human health criteria.

The EPA's pre-MSGP industrial stormwater sampling guidance, confirms that early storm event monitoring provides incomplete information:

> *Industrial applicants must generally collect two types of storm water samples: (1) grab samples collected during the first 30 minutes of discharge; and (2) flow-weighted composite samples collected during the first 3 hours of discharge (or the entire discharge, if it is less than 3 hours). Information from both types of samples is critical to fully evaluate the types and concentrations of pollutants present in the storm water discharge* (emphasis added).
>
> *The grab samples taken during the first 30 minutes of a storm event will generally contain higher concentrations of pollutants, since they pick up pollutants that have accumulated on drainage surfaces since the last storm event. Composite samples characterize the average quality of the entire stormwater discharge. Flow-weighted composite samples provide for the most accurate determination of mass load. The flow-weighted composite sample must be taken for either the first 3 hours or for the entire discharge (if the event is less than 3 hours long).* (EPA, 1992).

It is understandable that EPA did not require composite sampling in an attempt to reduce the cost and burden of analytical monitoring. However, it is not clear why the MSGP requires that such sampling take place during the most unrepresentative portion of a storm event. A study by UCLA researchers used to support revisions to California's Industrial Stormwater Permit regulations analyzed the effect that sampling time had on concentrations of TSS and zinc from highway site discharges (Stenstrom and Lee, 2005). In general, this study found that grab sample concentrations taken during the beginning of a storm were higher than the event mean concentration (EMC). The study rightfully concluded that collecting a sample in the early part of the storm overestimates the EMC and total pollutant load, and recommended that a more appropriate sampling time be identified. At a minimum, EPA should better justify why sampling should occur at a time that generally reflects concentrations above each storm's EMC.

Furthermore, the MSGP does not standardize the conditions for monitoring with respect to ensuring that the sampled storm event is representative for the area in terms of precipitation amount, duration, and intensity. The MSGP requires only that the sampled storm event be greater than 0.1 inches in depth. The sampling protocol should include criteria to ensure that the resulting data accurately portray the most common conditions for each site. The current approach is not adequate because the sampled storm event may be totally unrepresentative of normal characteristics. Ideally, EPA would require that sampling take place for a series of storm events that are representative of the typical range of events for the area. Because this approach may be cost prohibitive, at a minimum, EPA should consider revising the MSGP to reflect precipitation amounts, durations, and intensities that are within some acceptable range of long-term averages for the geographic area of interest.

Further evidence of the shortcomings of the analytical monitoring grab sampling approach is found in the UCLA study cited above (Stenstrom and Lee, 2005). The purpose of this study was to review the effectiveness of the monitoring program of California's general permit program for industrial activity stormwater discharges.[7] Because California's industrial stormwater discharge monitoring program is very similar to EPA's MSGP monitoring approach, this study's results should be directly applicable to EPA's monitoring program. The UCLA study found that the existing grab sample monitoring data "show very limited utility" (Stenstrom and Lee, 2005 at pg. 26). In particular, they attribute the failure of the monitoring data to identify differences in pollutant concentrations by industry sector to be a failure of the monitoring program. From their analysis of data compiled over the nine year period between 1992 and 2001 across the state of California, the UCLA researchers concluded that:

- The monitoring data were highly variable, with coefficients of variation that are generally higher than mean pollutant concentrations, and that are 2 to 60 times higher than those of other water quality monitoring programs;
- Sources of the variability include the use of grab sampling and untrained sampling personnel;
- The data are insufficient for use in identifying high dischargers and for use in identifying discharge differences by industry sector; and
- Data variability is so large that the collection of additional data points (up to ten or more storms per year) will still not provide the necessary data precision and a more promising approach is to use composite sampling in place of grab sampling.

c. *Current Benchmark Sampling Requirements Are Insufficient for Determining SWPPP Effectiveness*

As alluded to above, the MSGP approach of comparing grab sample benchmark monitoring results to benchmarks is inadequate for determining that SWPPP/BMP effectiveness. In response to related comments submitted to EPA on the 2000 MSGP, EPA stated the following:

> *Commenters also had concerns that only four samples and variability in conditions severely reduce the utility of monitoring results for judging BMP effectiveness. While not practicable for EPA to require an increase in monitoring, operators are encouraged to sample more frequently to improve the statistical validity of their results. Unless the proper data acquisition protocol for making a valid BMP effectiveness determination is rigorously followed, any other method used to assess BMP effectiveness would be qualitative, and therefore less reliable. The least subjective approach, and most beneficial to operators and stakeholders, EPA believes, remains a combination of visual and analytic monitoring, using analyte benchmark levels to target potential problems.*

[7] In particular, the original goal of California's monitoring program was to identify high-risk polluters. To test the effectiveness of its monitoring program, the study researchers analyzed monitoring data for the latest three years to determine the ability of the data to identify differences in industry sector discharge levels.

> *Statistical uncertainties inherent in the monitoring results will necessitate both operators and EPA exercising best professional judgement in interpreting the results. As stated above, when viewed as an indicator, analytic levels considerably above benchmark values can serve as a flag to the operator that his SWPPP needs to be reevaluated and that pollutant loads may need to be reduced. Conversely, analytic levels below or near benchmarks can confirm to the operator that his SWPPP is doing its intended job.* (page 64769 of 2000 MSGP)

In addition to the aforementioned sampling protocol shortcomings (e.g., use of grab samples and storm event variability), there are a number of additional issues that result in significant limitations in the MSGP's use of analytical monitoring to determine SWPPP effectiveness. The EPA acknowledges these issues in the 2006 MSGP:

> *EPA recognizes that there may be circumstances where benchmarks may not be reasonably achieved because of elevated background levels of pollutants. For example, high natural background levels of iron in soils or groundwater could contribute to exceedances of a benchmark. Concern has also been expressed that there may be other circumstances when an operator has taken all economically reasonable and appropriate measures to control pollutants, but a benchmark may still be exceeded. To address these situations, MSGP 2006 is proposing to provide an opportunity for permittees, following a review of their SWPPP, to determine that they are implementing all reasonable and appropriate BMPs to reduce pollutants in the discharge, and to document the basis for this determination in the SWPPP (EPA, 2005a at page 33).*

February 18, 2005 comments supplied by the California Paper Glass and Plastic Recyclers Monitoring Group illustrate the prevalence of metals in common building construction materials, vehicles and normal human activities, stating that it is "practically impossible for many manufacturing facilities, which are required to analyze storm water samples for zinc, to achieve benchmarks independent of whether they actually process or handle zinc or other metals in a manner that exposes them to storm water" (Funderburk, 2005 at page 4). EPA would benefit from a close examination of the 2000 permit metals data vis-a-vis the benchmarks, particularly now that EPA has lowered several of them.

EPA is concerned that high levels of benchmark exceedances may indicate that there are widespread inadequacies in SWPPPs, although there is no data analysis to support this concern.[8] Problems with the procedure for identifying and setting benchmarks is an alternate and very plausible explanation for the high level of exceedances. Due to both the many sources of variability and presence of background sources, it appears that reliance on benchmark exceedances to identify sources of pollution or ineffective BMPs is unlikely to be an effective strategy. Thus, there is substantial question about the utility of the EPA benchmarks as applied to the analytical monitoring regime.

[8] The likelihood that benchmarks are not achievable at many facilities with appropriate SWPPPs will only be increased by the 2006 MSGP's pollutant benchmark level reductions (in some cases, these reductions are dramatic–e.g., the benchmark for selenium is to be reduced from 0.2385 mg/L to 0.005 mg/L).

In the proposed 2006 MSGP, EPA states its intention to conduct further analysis to support development of the 2010 MSGP. These analyses would evaluate the usefulness of the monitoring data to the permittee or permitting authority in determining the adequacy of the SWPPP or the potential for water quality standards exceedances. As part of this effort, EPA asserts that it will evaluate the extent to which benchmark exceedances correlate with determinations that corrective action or additional measures to address water quality are needed. EPA clearly acknowledges the shortcomings of the current approach for determining SWPPP/BMP effectiveness; in the proposed 2006 MSGP, EPA requests comment on the following issues: 1) given the variability of analytic results, are benchmark exceedances a useful indicator of the need for corrective action, and 2) are there approaches other than analytical monitoring that would be effective in ensuring that SWPPPs are properly designed and implemented? Section III of this memorandum presents Pechan's response to these issues.

d. Questionable Data Used to Identify Sectors/Pollutants of Concern and to Support Determination of Benchmark Achievability

Section II.A.2.b. describes the data and procedure that EPA used to identify the pollutants and sectors for which analytical monitoring is required. As noted in the 2000 MSGP:

> *EPA did not conduct this analysis if a sector had data for a pollutant from less than three individual facilities. Under these circumstances, the sector or subsector would not have this pollutant identified as a pollutant of concern. This was done to ensure that a reasonable number of facilities represented the industry sector or subsector as a whole and that the analysis did not rely on data from only one facility.*

Even with data from more than three facilities, given the circumstances of the grab sampling, it is questionable whether sampling data for such a small number of facilities would be representative of an entire industry sector or subsector.

As noted earlier, in setting benchmark levels, EPA stated that they "sought to develop values which can realistically be measured and achieved by industrial facilities." EPA did not explain how it determined that these benchmarks could realistically be achieved. It appears that these determinations were based on a review of the group application sampling data. However, it would be difficult to base such a conclusion on these data. If this was the case, than this would not be sufficient information to determine achievability because of the variability of the sampling procedures, site characteristics, chemical use, storm events, background pollutant levels, and presence of BMPs that is inherent in the group application data. Without an examination of site-specific characteristics, it would be difficult for EPA to establish a nexus between the monitoring results and industrial activities/SWPPP elements.

For the 2006 MSGP in particular, EPA is proposing new benchmarks for several organic compounds (ethylbenzene, fluoranthene, toluene, and trichloroethylene) that require that facilities achieve pollutant concentrations equivalent to those required of drinking water. It is not clear if/how EPA determined that these benchmarks can be realistically achieved via cost-effective BMPs. At a minimum, EPA should describe the data and procedures that were used to determine that industrial facilities can realistically achieve each benchmark.

3. Cost Burden of 2006 MSGP Analytical Monitoring Requirements

This section identifies the cost burden associated with the 2006 MSGP analytical monitoring requirements. As noted below, the cost of these requirements is substantial, while EPA has not demonstrated that they provide any significant water quality benefits beyond those that accrue from the MSGP's visual monitoring and annual inspection requirements.

The EPA estimates the mean 5-year facility burden for complying with the 2006 MSGP's analytical monitoring requirements is $2,449, with a high-end facility cost estimate of $8,790 over the same time-frame (EPA, 2005b). Although it is not clear from the available information, it appears that these costs are based on the assumption of only one outfall per facility. If so, then these cost estimates are clearly understated.

The EPA also estimates a total annual cost estimate for 2006 MSGP analytical monitoring of approximately $1.79 million. Pechan was able to replicate this estimate by dividing EPA's mean 5-year per facility cost estimate ($2,449) by five, and then multiplying the result by EPA's estimate of 3,656 affected facilities (EPA, 2005b). It is important to note, however, that this estimate is based on the facilities in the very few States and tribal areas that do not have their own EPA approved MSGP program. In reality, most States with approved programs have adopted the current EPA MSGP program (a few have made their programs more stringent). Therefore, a more reasonable estimate of the cost of EPA's analytical monitoring requirements would be reflect the estimated total nationwide number of facilities that discharge stormwater associated with industrial activity. The EPA estimated that there were 100,000 such facilities in 1995 (60 FR 50804, 1995 at pg. 50807). Assuming no increase in the number of facilities since 1995, and using EPA's per facility analytical monitoring costs, which apparently represent monitoring only one outfall, Pechan estimates the national annual cost at approximately $50 million. Using similar conservative assumptions with EPA's high end per facility cost estimate ($8,790), Pechan estimates the national annual cost at approximately $176 million.

III. RECOMMENDATIONS FOR IMPROVING EPA APPROACH TO MSGP MONITORING

This section is divided into two major subsections. The first subsection discusses recommended revisions to the monitoring requirements of the proposed 2006 MSGP. This is followed by a subsection that describes analytical monitoring recommendations for EPA to consider in reissuing the MSGP in 2010.

A. REVISIONS TO PROPOSED 2006 MSGP

In the proposed 2006 MSGP, EPA specifically asks for comment on whether analytical monitoring exceedances are a useful indicator of the need for revisions to the SWPPP and whether other approaches would be effective in ensuring that SWPPPs are properly designed and implemented. Because of the numerous shortcomings of the 2006 MSGP analytical monitoring requirements, which are detailed in Section II.B.2. of this memorandum, EPA should eliminate the analytical monitoring requirement from the 2006 MSGP. Although the goals of analytical monitoring under the proposed 2006 MSGP are worthy, the requirements should not be retained because the following serious shortcomings can not be fully addressed in time for this permit cycle:

(1) The setting of current benchmark levels is based on insufficient data – the setting process does not account for background pollutant levels; equates stormwater discharges to receiving waters (e.g., does not account for mixing); and does not properly address whether levels are realistically achievable;

(2) The current sampling protocol is arbitrary/not scientifically supportable – as noted by EPA in its 1992 industrial stormwater monitoring guidance, "an accurate determination of mass load requires flow-weighted composite sampling for either the first 3 hours or for the entire discharge (if the event is less than 3 hours long)." The sampling protocol should better reflect the correlation between water quality-based benchmarks and mass event load, and not the load based on the first 30 minute discharge "worst case" condition sampling that is currently required. As such, the current sampling protocol requirements are arbitrary and result in worst case values that result in continuation of overly burdensome requirements for SWPPP review and analytical monitoring;

(3) EPA acknowledges that it does not have any evidence that MSGP benchmark monitoring is sufficiently robust to evaluate SWPPP/BMP performance:

> *EPA acknowledges that, considering the small number of samples required per monitoring year (four), and the vagaries of storm water discharges, it may be difficult to determine or confirm the existence of a discharge problem as a commenter claimed. ...EPA has prepared an analysis of benchmark data, which is available in the docket for this permit... EPA has not yet been able to complete this analysis to determine whether these exceedances provide useful indicators of SWPPP inadequacies or potential water quality problems. In developing the 2010 permit, EPA intends to conduct further analysis on selected industry sectors that are discharging to*

> *both impaired and unimpaired water bodies to evaluate the usefulness of the monitoring data to the permittee or permitting authority in determining the adequacy of the SWPPP or the potential for water quality standards exceedances. As part of this analysis, EPA will assess the extent to which benchmark exceedances correlate with determinations that corrective action or additional measures to address water quality are needed* (EPA, 2005a at pp. 38-39).

(4) The data EPA used to identify industry sectors/pollutants of concern and benchmark achievability are not sufficient for these determinations. EPA did not determine that the sampling data submitted to support the group applications: reflect representative industrial activities for the given sector/subsector; reflect representative industrial activity for the given chemical (i.e., may largely reflect background pollutant levels rather than typical industrial activity); occurred during representative storm events; and reflect implementation of proper sampling procedures. Without this information, and information on the implementation of BMPs at each facility, any conclusions about the achievability of benchmarks is speculative.

Given the concerns raised above, EPA should eliminate the analytical monitoring requirements until such time that the burden of benchmark monitoring can be justified relative to the information that it may provide for evaluating SWPPP effectiveness. In place of the 2006 MSGP's burdensome analytical monitoring requirements, EPA should utilize visual monitoring, which provides important feedback to facility operators on the effectiveness of their SWPPPs at much lower cost.[9] Although EPA has noted concerns with pollutants that may not be detectable via visual examinations, it is important to note that the amount of heavy metals, and other constituents that readily adsorb to soil particles, varies directly with the amount of sediment entrained within a sample, which is observable in such examinations. In addition, if practicable, EPA should consider revising the sampling protocol to require that visual examinations occur during representative storm events, and from either multiple periods during each storm event, or for a single time period that is determined to be more representative of mean pollutant concentrations than the first 30 minutes of discharge.

B. IMPROVEMENTS FOR 2010 MSGP

In the proposed 2006 MSGP, EPA has signaled its intention to reevaluate the use of analytical monitoring to assess SWPPP effectiveness:

> *In developing the 2010 permit, EPA intends to conduct further analysis on selected industry sectors that are discharging to both impaired and unimpaired water bodies to evaluate the usefulness of the monitoring data to the permittee or permitting authority in determining the adequacy of the SWPPP or the potential for water quality standards exceedances. As part of this analysis, EPA will assess the extent to which benchmark exceedances correlate with determinations that corrective*

[9] EPA estimates the average annual total monitoring burden to be $490, with a high-end annual cost estimate of $1,758. The cost of visual examination accounts for less than 20 percent of average costs, and approximately 5 percent of high-end costs (EPA, 2005b).

> *action or additional measures to address water quality are needed. EPA requests comment on the following: 1) given the variability of analytic results, are benchmark exceedances a useful indicator of the need for corrective action, 2) are they a useful indicator of reasonable potential to cause or contribute to a violation of water quality standards, 3) are there other values besides water quality criteria that should be considered as the bases for benchmark values, and 4) are there approaches other than analytic monitoring that would be effective in ensuring that SWPPPs are properly designed and implemented? EPA intends to engage interested stakeholders in the development of the study design* (EPA, 2005a at page 39).

Over the next several years, EPA has the opportunity to develop the necessary information to support a common sense justifiable regulatory approach for evaluating the effectiveness of SWPPPs in reducing the impact of industrial stormwater discharges on the quality of receiving waters. Putting aside the shortcomings of EPA's analytical monitoring protocol, the following section identifies the information that EPA would need to obtain to evaluate the utility of the analytical monitoring requirements. This section is followed by a section that describes a a new comprehensive data collection effort that would provide EPA with valid analytical monitoring data for use in this evaluation. The final section briefly identifies alternatives to the use of analytical monitoring for evaluating SWPPP effectiveness.

1. Use of 2006 MSGP Analytical Monitoring Data in Future Study

While this report concludes that the analytical monitoring protocol does not produce valid data for use in determining SWPPP effectiveness, as discussed above, EPA wishes to study the utility of its current analytical monitoring approach. For the agency to evaluate the validity of this approach, it would need to obtain a statistically significant sample of the following information from 2006 MSGP permittees: (1) analytical monitoring results (to determine the degree of benchmark exceedances); (2) the written permittee/permitting authority's evaluation of benchmark exceedances, (3) results from the site inspection and review of visual monitoring; (4) a description of corrective actions taken; (5) whether discharge is to stormwater-impaired waters; and (5) the effects of the discharge on receiving water quality. After the collection of this information, EPA would have better information for making a determination of whether the benchmark levels are appropriate or require revisions, whether grab samples should be taken under more standardized conditions, or whether to eliminate analytical monitoring of grab samples, as this report concludes. The following section provides a more robust approach to evaluating SWPPP effectiveness that also addresses the analytical monitoring protocol concerns noted earlier.

2. Comprehensive Information to Improve MSGP Approach to Evaluating SWPPP Element Effectiveness

In order to properly determine the effectiveness of SWPPP elements (BMPs) in reducing the impact of industrial stormwater discharges on the quality of receiving waters, EPA would need to obtain the following information:

- Storm event depth, duration, and intensity during sampling procedures and the long-term averages for each for the month in which sampling occurred;

- Background pollutant discharge concentrations in absence of industrial activities;
- Discharge pollutant concentrations before and after SWPPP element (BMP) implementation, both before and after mixing in receiving waters; and
- A full accounting of typical industrial activities that take place at the facility; a list of BMPs implemented and their costs; the specific industrial activities taking place on the day of sampling, recent history of known chemical spills (including volume spilled); annual volume of chemicals stored/handled, and volume of chemicals stored/handled on day of sampling.

In addition, as noted earlier, EPA would need to require the use of composite sampling to ensure that the discharge pollutant concentrations represent valid estimates, and are not unduly affected by the variability inherent in grab sampling.

If EPA were to obtain a representative statistical sample of all of the parameters noted above, then it will have the necessary scientifically valid information for setting achievable benchmarks for specific industrial activities/volumes of chemicals handled given background pollutant levels and storm event characteristics. However, it is clear that this data collection effort would be a huge undertaking that would likely require expenditures that outweigh the water quality benefits that would ultimately accrue.[10]

3. Potential Alternatives to Analytical Monitoring

The purpose of this section is to briefly identify alternatives to the use of analytical monitoring for evaluating SWPPP effectiveness. If EPA determines that it does not have the necessary resources to obtain and analyze the information noted above, then EPA may want to consider the following:

(1) Requiring facilities subject to the MSGP to prepare annual reports that document the following information: (a) results of visual monitoring; (b) inspection of facility/site attributes with potential to affect stormwater pollutant discharges to receiving waters (i.e., an annual inspection of facility premises to identify leaks, spills, surface erosion, etc.); (c) documentation of activities taken to address issues identified from (a) and/or (b) or rationale why no such actions are necessary; and (d) certification that the facility has not been notified/is not aware that stormwater discharges due to pollutants that are directly related to the facility's industrial activity are contributing to an exceedance of any water quality standard in receiving waters;

(2) With cooperation from industry trade associations, providing technical support for the development of model SWPPPs for specific industry sectors/subsectors; and

[10] Perhaps the most cost-effective approach would be for EPA to initiate/coordinate the development of a database similar to the International Stormwater Best Management Practices (BMP) Database (IBMPDB). The IBMPDB provides analytical monitoring results from over 1,600 systems treating urban runoff that have been collected under a specified protocol and validated by the IBMPDB sponsors. A new BMP database would need to be specific to industrial activities and require the collection of the information noted in this section using sampling protocols approved by EPA.

(3) Developing pollutant specific percentage reduction requirements (especially for areas that discharge into, or are within a certain distance of distressed water bodies). Such percentage reductions can be based on studies of BMP effectiveness, taking the cost of various BMPs into account (note that it may be difficult to quantify the effect of BMPs because multiple variables affect BMP effectiveness--e.g., site-specific topography).

IV. REFERENCES

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