



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

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OFFICE OF
WATER

MEMORANDUM

SUBJECT: Best Management Practices (BMPs) in NPDES Permits -
Information Memorandum

FROM: James D. Gallup, Chief
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TO: Regional Permit Branch Chiefs
Region I - X

This memorandum provides information about the use of best management practices (BMPs) in NPDES permits. Please make the information available to your staff and your States as you deem appropriate.

BMPs are valuable permitting tools where, for example, numerical effluent limits are infeasible, where housekeeping problems exist or where facilities have a history of leaks or spills. Other situations at industrial facilities may warrant BMPs after a case-by-case evaluation. BMPs are appropriately used to supplement numerical effluent limitations in permits. They are frequently procedural, flexible and qualitative. We envision BMPs to be particularly useful as we address stormwater and combined sewer overflows in permits.

Section 402(a)(1) of the Clean Water Act authorizes the incorporation of BMPs into permits on a case-by-case basis. BMPs should be considered for all permits issued or reissued to industrial facilities to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage which are associated with, or ancillary to, industrial manufacturing or treatment processes. Ancillary operations include materials storage areas; in-plant transfer, process and material handling areas; loading and unloading operations; plant site runoff; and sludge and waste disposal areas. BMPs will be

particularly useful in issuing permits for storm water discharges associated with industrial activity. In addition, the regulatory scheme that is being developed for permits for discharges from municipal separate storm sewer systems will emphasize a variety of source control measures, including management practices, control techniques and systems, and BMPs when an end-of-pipe treatment technology is not appropriate for this type of discharge. Source control measures will also play an important role in issuing permits for combined sewer overflows.

Attachment 1 is a bibliography of BMP guidance dating back to 1979. BMPs are placed in permits in two basic ways: BMP plans and site or pollutant-specific BMPs. BMP plans are usually kept on-site and made available to the permitting authority on request. The normal compliance schedule is to require preparation of the plan within six months and implementation within twelve months of permit issuance. Nine specific requirements have been identified as basic components of BMP plans. These specific requirements are summarized in attachment 2, Overview of Best Management Practices. Site-specific BMPs may be imposed as conditions of the BMP plan or as independent provisions of the permit, often in the special conditions. Site-specific or pollutant-specific BMPs are left to the discretion of the permit writer and are highly dependent on a careful review of the circumstances at a particular facility. Attachment 3 is a listing of permits, by permit number, which contain BMP requirements. Attachment 4 summarizes recent actual incidents preventable by effective BMPs.

Should you or your staff need additional information on BMPs, please contact Hap Thron of my staff at FTS 475-9537.

Attachments: 1 - Bibliography of BMP Guidance
2 - Overview of Best Management Practices
3 - Permits with BMP Plans or Site-specific BMPs
4 - Summary of Recent Chemical Incidents
Preventable by Effective BMPs.

Bibliography

Technical Guidance on BMPs in the NPDES Program

<u>Form of Guidance</u>	<u>Title</u>	<u>Date</u>
Technical Paper	Best Management Practices for Control of Toxic and Hazardous Materials; Thron, H.M. et. al., presented at the 34th Purdue Industrial Waste Conference, Lafayette, Indiana	5/9/79
Report EPA No. 600/9-79-045	NPDES Best Management Practices Guidance Document; Hydroscience Inc., EPA Contract Number 68-03-2568	12/79
Report	NPDES Best Management Practice Guidance Document (Revised); NPDES Technical Support Branch	6/81
Technical Paper	Best Management Practices; Useful Tools for Cleaning Up, Thron, H.M., and Rogoshwesi, P.J., presented at the 1982 Hazardous Material Spills Conference, Milwaukee, Wisconsin	4/20/82
Case histories	NPDES Best Management Practices; Case Histories; JRB Associates, Inc., EPA Contract Number 68-01-5052,	1/29/83
Technical Memorandum No. 1	Technical Guidance on Best Management Practices (BMPs) in NPDES Permits; Jordan, J.W. to Regional Permit Branch Chiefs	4/15/83
Technical Memorandum No. 2	Technical Guidance on Best Management Practices (BMPs) in NPDES Permits; Jordan, J.W. to Regional Permit Branch Chief	3/23/84

Information Memorandum	Best Management Practices (BMPs) in NPDES Permits; Grubbs, Geoffrey to Regional Permit Branch Chief	6/3/85
Information Memorandum	Best Management Practices (BMPs) in NPDES Permits; Gallup, James to Regional Permit Branch Chiefs	8/29/86
Information Memorandum	Best Management Practices (BMPs) NPDES Permits; Gallup, James to Regional Permit Branch Chiefs	8/11/87
Information Memorandum	Best Management Practices (BMPs) in NPDES permits; Gallup, James to Regional Permit Branch Chiefs	8/19/88

BEST MANAGEMENT PRACTICES

INTRODUCTION:

Best Management Practices or BMPs are measures to prevent or mitigate water pollution from sources ancillary to the industrial manufacturing or treatment process. BMPs are broad and may include processes, procedures, human actions or construction. In essence, they are anything a plant manager, department foreman, environmental engineer, consultant or employee may identify as a method to abate water pollution. They may be inexpensive, such as a liquid level alarm in a material transfer operation, or they may be costly, such as secondary containment around a tank farm. In short, BMPs can be just about anything that does the job - the job of preventing toxic pollutants or hazardous substances from damaging the aquatic environment.

Experience has shown that three quarters of all spills of hazardous chemicals can be attributed, in one way or another, to human error. Improper procedures, lack of training and poor engineering are among the major causes of spills. BMPs are aimed at preventing spills and similar environmental incidents by stressing the importance of management and employee awareness of potential spill situations.

Traditionally, NPDES Permits have contained chemical-specific, numerical effluent limits. Effluent guidelines are not always available to prescribe these limits nor to guarantee water quality sufficient for the protection of indigenous aquatic life. To improve water quality, the Clean Water Act (CWA) provides for water pollution controls supplemental to effluent limitation guidelines.

Best Management Practices are one such supplemental control. Pursuant to Sections 304 and 402 of the CWA, BMPs may be incorporated as permit conditions. In the context of the NPDES program, BMPs are actions or procedures to prevent or minimize the potential for the release of toxic pollutants or hazardous substances in significant amounts to surface waters. BMPs, although normally qualitative, are expected to be most effective when used in conjunction with numerical effluent limits in NPDES permits.

BMPS IN NPDES PERMITS:

BMPs are placed in permits in two basic ways: BMP plans and site or pollutant-specific BMPs. Site-specific BMPs may be imposed as specific conditions of the BMP plan or as independent provisions of the permit. BMP plans are usually kept on-site and made available to the permitting authority on request. The normal compliance schedule is to require preparation of the plan within six months and implementation within twelve months of permit issuance. Nine specific requirements have been identified as a basis for developing BMP plans in the NPDES program. Site-specific or pollutant-specific BMPs are left to

the discretion of the permit writer and are highly dependent on a careful review of the circumstances at a particular facility. The minimum requirements of a BMP plan are presented below.

MINIMUM REQUIREMENTS OF A BMP PLAN:

1. General Requirements

- Name and location of facility
- Statement of BMP policy and objective
- Review by plant manager

2. Specific Requirements

- BMP committee
- Risk identification and assessment
- Reporting of BMP incidents
- Materials compatibility
- Good housekeeping
- Preventive maintenance
- Inspections and records
- Security
- Employee training

BMP COMMITTEE:

The BMP committee is that group of individuals within the plant organization which is responsible for developing the BMP plan and assisting the plant management in its implementation, maintenance and updating. Thus, the committee's functions are similar to those of a plant fire prevention or safety committee. Plant management, not the committee, has overall responsibility and accountability for the quality of the BMP plan.

The scope of activities and responsibilities of the BMP committee should include all aspects of the facility's BMP plan, such as identification of toxic and hazardous materials addressed in the plan; identification of potential spill sources; establishment of incident reporting procedures; development of BMP inspections and records procedures, review of environmental incidents to determine and implement necessary changes to the BMP plan; coordination of incident notification, response, and clean-up procedures; establishment of BMP training programs for plant personnel; and aiding interdepartmental coordination in carrying out the BMP plan.

RISK IDENTIFICATION AND ASSESSMENT:

The areas of the plant subject to BMP requirements should be identified by the BMP committee, plant engineering group, environmental engineer or others in the plant. Each such area should be examined for the potential risks of discharges to receiving waters of toxic pollutants or hazardous substances from ancillary sources. Any existing physical means (dikes,

diversion ditches, etc.) of controlling such discharges also should be identified.

A hazardous substances and toxic chemicals inventory (materials inventory) should be developed as part of the risk identification and assessment. The details of the materials inventory should be proportionate to the quantity of toxic pollutants and hazardous substances on site and their potential for reaching the receiving waters.

REPORTING OF BMP INCIDENTS:

A BMP incident reporting system is used to keep records of incidents such as spills, leaks, runoff and other improper discharges for the purpose of minimizing recurrence, expediting mitigation or cleanup activities, and complying with legal requirements. Reporting procedures defined by the BMP committee should include: notification of a discharge to appropriate plant personnel to begin immediate action; formal written reports for review and evaluation by management of the BMP incident and revisions to the BMP plan; and notification, as required by law, of government and environmental agencies.

MATERIALS COMPATIBILITY:

Materials compatibility includes the consideration of: compatibility of the chemicals being stored with the container materials; compatibility of different chemicals upon mixing in a container; and compatibility of the container with its environment. The BMP plan should provide procedures to address these three aspects in the design and operation of the equipment used for the storage or transfer of toxic and hazardous materials.

Incompatible materials can cause equipment failure resulting from corrosion, fire or explosion. Equipment failure can be prevented by ensuring that the hazardous substances or toxic pollutants are compatible with the container contents and the surrounding environment.

GOOD HOUSEKEEPING:

Good housekeeping is the maintenance of a clean, orderly work environment and contributes to the overall facility pollution control effort. Periodic training of employees in housekeeping techniques for those plant areas where the potential exists for BMP incidents reduces the possibility of mishandling of chemicals or equipment.

Examples of good housekeeping include neat and orderly storage of bags, drums and piles of chemicals; prompt cleanup of spilled liquids to prevent significant runoff to surface waters; sweeping, vacuuming or other cleanup of accumulations of dry chemicals as necessary to prevent them from reaching receiving waters; and provision for storage of containers or drums to keep them from protruding into open walkways or pathways.

PREVENTIVE MAINTENANCE:

An effective preventive maintenance (PM) program is important to prevent environmental incidents. A PM program involves inspection and testing of plant equipment and systems to uncover conditions which could cause breakdowns or failures with resultant significant discharges of chemicals to surface waters. The program should prevent breakdowns and failures by adjustment, repair or replacement of items.

A PM program should include a suitable records system for scheduling tests and inspections, recording test results and facilitating corrective action. Most plants have PM programs which provide a degree of environmental protection. A BMP plan should not require the development of a redundant PM program. Instead, the plan should reinforce the objective to have qualified plant personnel (e.g., BMP committee, maintenance foreman or environmental engineer) evaluate the existing plant PM program and recommend to management those changes, if any, needed to address BMP requirements.

A good PM program includes identification of equipment or systems to which the PM program should apply; periodic inspections or tests of identified equipment and systems; appropriate adjustment, repair, or replacement of items; and maintenance of complete PM records on the applicable equipment and systems.

INSPECTIONS AND RECORDS:

An inspection and records system detects and documents actual or potential BMP incidents. The BMP plan should include written inspection procedures and optimum intervals between inspections. Records to show the completion date and results of each inspection should be signed by the appropriate supervisor and maintained for a period of three years. A tracking or follow-up procedure should be instituted to assure that adequate response and corrective action have been taken. The record-keeping portion of this system can be combined with the existing spill reporting system in the plant.

The inspection and records system should include those equipment and plant areas having the potential for significant discharges. To determine the inspection frequency and inspection procedures, experienced personnel should evaluate the causes of previous incidents, the likelihood of future incidents, and assess the probable risks for incident occurrence or recurrence. Consideration should be given to the nature of chemicals handled, materials of construction, and site-specific factors including age, inspection techniques and cost effectiveness of BMPs employed.

SECURITY:

A security system prevents accidental or intentional entry to a plant which might result in vandalism, theft, sabotage or other improper or illegal use of plant facilities that possibly

could cause a BMP incident. Most plants have security systems to prevent unauthorized entry.

The BMP plan should describe those portions of the existing security system and any improvements which are necessary to ensure that toxic chemicals are not discharged to receiving waters in significant quantities as a result of unauthorized entry. Documentation of the security system may require separate filing from the BMP plan to prevent unauthorized individuals from gaining access to sensitive or confidential information.

EMPLOYEE TRAINING:

Employee training programs should instill in personnel, at all levels of responsibility, a complete understanding of the BMP plan. Training should address the processes and materials on the plant site, the safety hazards, the practices for preventing discharges, and the procedures for responding properly and rapidly to toxic and hazardous materials incidents.

Meetings should be conducted at least annually to assure adequate understanding of the objectives of the BMP plan and the individual responsibilities of each employee. Typically, these could be a part of routine employee meetings for safety or fire protection. Such meetings should highlight previous spill events or failures, malfunctioning equipment, and new or modified BMPs.

Training sessions should review the BMP plan and associated procedures. Just as fire drills are used to improve an employee's reaction to a fire emergency, spill or environmental incident drills may serve to improve the employee's reactions to BMP-related incidents. Plants are encouraged to conduct spill drills on a quarterly or semi-annual basis. Spill or incident drills serve to evaluate the employee's knowledge of BMP-related procedures and are a fundamental part of employee training.

SITE-SPECIFIC OR POLLUTANT-SPECIFIC BMPS:

Site-specific and pollutant-specific BMPS are those designed to address conditions peculiar to a facility or pollutant. The need for specific BMPS at a facility often will be discovered in conjunction with other permit-related activities, such as compliance inspections. Poor housekeeping or a history of spills, for example, indicate a need for site-specific BMPS to supplement the quantitative effluent limits on specific pollutants in the permit. These "situation-specific" BMPS may be conventional, such as secondary containment around a storage tank or innovative, such as siting containers so that a spill caused by a careless forklift operator will not flow into the river. Other examples of site-specific BMPS are contained in recent NPDES permits.

PERMITS WITH BMP PLANS OR SITE - SPECIFIC BMP'S

BMP Plan (required in permit)

AL 22314	AL 46370	AL 47597
AR 38512	AZ 2144	CO 248
CT 86	DE 20001	FL 1104
FL 1139	FL 2771	FL 34690
FL 37338	FL 37923	IA 191
IA 205	IA 2900900	ID 809
IL 2267	IN 2666	IN 49751
IN 53171	KY 1341	KY 1431
KY 1716	KY 3603	LA 54828
LA 59846	MD 94	MD 1279
MD 53431	MO 370	MO 4863
NC 58297	NE 60	NE 507
NE 647	NE 701	NE 1210
NE 26565	NJ 787	NJ 3166
NJ 3867	NJ 4120	NJ 4286
NJ 5061	NJ 5240	NY 574
NY 1635	NY 2160	NY 2399
NY 3310	NY 3328	NY 11043
OH 957	OH 6327	OR 515
OR 1589	OR 1627	OR 2542
SC 302	SC 914	SC 1163
SC 1333	SC 1368	SC 1856
SC 2453	SC 2798	SC 3255
SC 3441	SC 24554	TN 29157
VA 26557	WA 281	WA 647
WA 931	WA 5095	WV 86
WV 108	WV 167	WV 370
WV 841	WV 1121	WV 1279
WV 1651	WV 2399	WV 2496
WV 4588	WV 4740	

BMP's (Best Management Practices
-- facilities and practices in
use)

AK 24538	AL 213	AL 1970
AL 3891	AR 1171	CA 57177
CO 35394	FL 2488	FL 37869
GA 2071	IA 205	LA 5223
LA 38245	MO 4863	MS 2941
NY 72061	OR 2542	RI 21164
WA 2615	WV 23281	

Source: Abstracts of Industrial NPDES Permits, OWEP 86 - 01
July, 1986

SUMMARY OF RECENT CHEMICAL INCIDENTS PREVENTABLE BY EFFECTIVE BMPs

<u>Incident Date</u>	<u>Facility</u>	<u>Chemical</u>	<u>Quantity</u>	<u>Cause</u>	<u>BMPs to Prevent Incident</u>
March 4, 1987	Mid-Valley Pipeline Lima, OH	Crude Oil	126,000 gal	Pipe leak	Non-destructive testing Visual Inspection
April 6, 1987	Kennebec River Waterville, ME	Aqueous Ammonia and Glyoxal	726 drums	Severe Flooding, drums stored near river	Proper storage Good housekeeping
April 24, 1987	Nyacol Products Ashland, MA	Sodium Picrate	43 lbs	Dumping	Training Security
June 2, 1987	Unocal Chemical Kenai, AK	Anhydrous Ammonia	8 tons	Failed Flange	Preventive maintenance Non-destructive testing Visual Inspection
Sept. 13, 1987	Monsanto Everett, MA	Phosphorus Trichloride	300 gal	Open Valve	Training Visual Inspection
Oct. 15, 1987	Haliburton Services Mount Laurel, NJ	Hydro- chloric Acid	10,000 gal	Ruptured Tank	Non-destructive testing Visual Inspection Preventive Maintenance
Oct. 30, 1987	Marathon Oil Texas City, TX	Hydrofluoric Acid	Unknown	Crane Accident damaging pressurized tank	Training

