STATE WATER RESOURCES CONTROL BOARD GENERAL PERMIT FOR DISCHARGES OF STORM WATER ASSOCIATED WITH INDUSTRIAL ACTIVITIES (IGP)

Analysis of the Compliance Costs for the IGP

An analysis and estimate of the cost to comply with three versions of requirements – the 1997 IGP (Water Quality Order No. 97-03-DWQ), the draft IGP released in January of 2011, and the current draft of the IGP.

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**This report was prepared by the CA State Water Board’s Division of Water Quality Storm Water Program (Industrial and Construction Discharges Unit – ICDU) with assistance from the Office of Research Planning and Performance**

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# Executive Summary

The purpose of this analysis is to provide an estimate of the compliance costs associated with the California State Water Resources Control Board’s Statewide General Permit for Discharges of Storm Water Associated with Industrial Activity (IGP). In preparing this study, staff has followed the methodology recommended by the US EPA in preparing economic analysis of water quality standards. This study is not a full economic analysis but an estimate of the costs of the pollution control projects necessary to comply with the regulations as described in section 3.1 of the referred methodology.

The key findings of this report include:

* Overall, the average annual cost of compliance of the new permit for facilities with no exceedances would increase between 5% and 12% compared to the annual cost of compliance with the 1997 IGP.
* The increase in compliance costs would be more significant for those facilities with exceedances. Staff does not expect a significant increase in compliance costs for those facilities with no exceedances.
* Annual average cost of compliance with the new permit depends on multiple factors including size of operations, location, and level of exceedances. Staff estimated annual compliance costs for the 1997 IGP to range between $23,000 to approximately $137,000. For facilities with no exceedances, compliance with the 2012 draft will cost between $25,000 and approximately $155,000 annually.
* Facilities with exceedances would see a more significant increase in costs to bring the facility in compliance. Facilities with Level 1 status (one NAL exceedance) would face an additional annual average cost between $97 and $622. Facilities with Level 2 status (second NAL exceedance for same parameter) would face an additional annual average cost between $1,138 and up to $38,641.
* The annual average cost of compliance with the 2012 draft is approximately half (50% less) of what the 2011 draft originally required.
* Based on staff’s best judgment, the most likely scenario is that 50% of facilities will have no exceedances, 50% of facilities will reach Level 1, and 25% will reach Level 2. Using this assumption, the total annual average compliance costs of the 2012 draft as compared to the 1997 IGP would be increased by approximately 7% for industry as a whole.

# Cost Analysis Approach

The purpose of this analysis is to provide an estimate of the compliance costs associated with the California State Water Resources Control Board’s Statewide General Permit for Discharges of Stormwater Associated with Industrial Activity (IGP). The analysis is chronologically-based, meaning it includes estimates of compliance costs for the IGP adopted in 1997 and subsequent drafts prepared in 2011 and 2012 during the permit’s reissuance process. In preparing this study staff has followed the methodology recommended by the US EPA in preparing economic analysis of water quality standards ([1995 version](http://water.epa.gov/scitech/swguidance/standards/economics/)). This study is not a full economic analysis but an estimate of the costs of the pollution control projects necessary to comply with the regulations as described in section 3.1 of the referred methodology.

1997 IGP:

<http://www.swrcb.ca.gov/water_issues/programs/stormwater/docs/induspmt.pdf>

Draft 2011 IGP:

<http://www.swrcb.ca.gov/water_issues/programs/stormwater/indstpermits.shtml>

Draft 2012 IGP:

<http://www.swrcb.ca.gov/water_issues/programs/stormwater/indstpermits.shtml>

# Background

The Federal Clean Water Act (CWA)[[1]](#footnote-2) prohibits discharges from point sources to waters of the United States, unless in compliance with a National Pollutant Discharge Elimination System (NPDES) permit (CWA § 301(a)). In 1987, the CWA was amended to establish a framework for regulating municipal and industrial storm water discharges under the NPDES program (CWA § 402(p)). In 1990, the United States Environmental Protection Agency (US EPA) promulgated regulations establishing application requirements for storm water permits for specified categories of industries (40 C.F.R. § 122.26, 55 Fed. Reg. 47990).

Discharges of storm water associated with industrial activity are regulated pursuant to CWA section 402(p)(3)(A). This provision requires that NPDES permits for discharges associated with industrial activity must implement CWA section 301, which requires that dischargers comply with technology-based effluent limitations, as well as any more stringent limitations necessary to meet water quality standards (CWA § 402(p)(3)(A)). Technology-based effluent limitations applicable to industrial activities are Best Practicable Control Technology Currently Achievable (BCT) for conventional pollutants, and Best Available Technology Economically Achievable (BAT) for toxic and non-conventional pollutants (CWA § 301(b)(1)(A) and (2)(A)). To ensure strict compliance with water quality standards, NPDES permits can require a discharger to implement Best Management Practices (BMPs), narrative effluent limitations, and/or numeric effluent limitations (CWA §§ 301(b), 402; 40 C.F.R. §§ 122.26, 122.28, 125.3).

On April 17, 1997, the State Water Resources Control Board (State Water Board) issued a statewide general permit for storm water discharges associated with industrial activities, excluding construction activities, Water Quality Order No. 97-03-DWQ (1997 IGP). In January 2011 the State Water Board released a draft IGP (draft 2011 IGP) to replace the expired 1997 IGP. The State Water Board has now released a revised draft (draft 2012 IGP). In general, the draft 2012 IGP requires dischargers to:

* Develop and implement Storm Water Pollution Prevention Plans (SWPPPs) that include BMPs that will achieve BAT and BCT to comply with water quality standards (includes operational source control and structural/treatment control BMPs).
* Eliminate unauthorized non-storm water discharges (NSWDs).
* Conduct analytical storm water monitoring for indicator parameters, compare sampling results to benchmark concentrations or numeric action levels (NALs) for all monitored parameters, and perform Exceedance Response Actions (ERAs) if there are exceedances. Most of the NALs were derived from US EPA’s 2008 Multi Sector General Permit for Stormwater Discharges Associated with Industrial Activity (2008 MSGP).
* Perform inspections and visual observations.
* Electronically submit all permit-related compliance documents. These documents include, but are not limited to; Permit Registration Documents (PRDs), No Exposure Certifications (NEC), SWPPPs, Annual Reports, Notices of Termination (NOTs), and ERA reports.

## Comments on the January 2011 Draft

A significant number of comments were received on the draft 2011 IGP regarding the increased compliance costs relative to the 1997 IGP. Subsequent to the comment period, the State Water Board directed staff to carefully evaluate these comments and, where feasible, revise the permit requirements to minimize compliance costs while satisfying the requirements of the CWA and meeting the critical goals and objectives of this reissuance process.

The most commented upon elements of the draft 2011 IGP were the proposed numeric effluent limitations (NELs), the increased number of reportable inspections and/or visual observations, and the compulsory training requirements. In response to these comments and State Water Board direction, NELs have been eliminated, revisions and clarification were made so that the number of inspections and visual observations are the same as the 1997 IGP (with the exception of pre-storm visual observations), and the compulsory training requirement has been simplified. Additionally, a new ERA system has been devised that (1) more narrowly focuses on those facilities with the highest concentrations of pollutants, and (2) allows dischargers to avoid costly structural or treatment controls if it is proven that the pollutant concentrations are related to non-industrial sources, natural background conditions, or if the facility is already in compliance with BAT/BCT.

# Methods and Costs

When determining costs for compliance, staff used a variety of sources including existing literature/reports, discussions with the California Regional Water Quality Control Board’s (Regional Water Boards) compliance and enforcement staff, discussions with stakeholders, dischargers, comments received on previous drafts, and State Water Board staff experience with permit implementation.

Staff assigned both a low and a high cost estimate for many of the costs to represent the range of costs and facilities we understand to be subject to the IGP. In each instance they are used, the high estimate is generally meant to represent the cost for a typical large facility and the low estimate is generally meant to represent the cost for a typical small facility. Actual costs for any given facility will obviously vary based on a number of factors such as the size of the facility, the number of sampling locations, and number of personnel onsite assigned to each task, etc. The high end costs are not meant to include extremely large facilities with multiple industrial activities (such as some military bases) as these have disproportionally higher costs and are few in numbers (less than 2% of all facilities). Many of the permit requirements have labor costs associated with them. Labor costs vary throughout the state, from site-to-site, and are dependent on who is performing each task. Therefore, most of this analysis does not include monetary estimates for costs associated with labor and instead only assigns a time estimate (in hours) which we believe it would take to perform that task needed to comply with the specific permit requirement.

Overall permit compliance costs are divided into three main categories: One-Time Costs, Yearly Costs, and Exceedance Dependent Costs. The assumptions and calculation steps are documented in the IGP Costs Analysis Workbook ([Appendix 1](#Appendix1bookmark)). An overview of the methods and estimated costs for permit compliance are presented below.

## One-Time Costs

One-time costs represent capital costs incurred by dischargers within the permit term. These costs include training, permit registration, SWPPP development, purchasing of necessary equipment, and installation of structural/treatment control BMPs.

### Training

To support the development of an effective SWPPP in compliance with BAT/BCT and water quality standards, both the draft 2011 and 2012 IGPs include compulsory training requirements. Under the draft 2012 IGP, California licensed professional civil engineers, professional geologists, and certified engineering geologists (collectively, Licensees) are exempted from the training requirements. Therefore, if a facility has a staff member who is a Licensee and is qualified to implement the permit requirements, these training costs would not be necessary.

Class fees, exam costs, and estimates for travel, per diem, and lodging are based on Construction General Permit (CGP) training requirements for QSPs and QSDs. Training requirements for the draft 2011 IGP are analogous to the CGP and therefore costs should be similar. Staff looked at where the QSD/QSP courses are currently being offered and found that these courses are currently being offered in every region. Staff selected a low travel mileage of 30 miles and a high of 400 miles one-way. These mileages were then multiplied by two to represent round-trip mileage and where given an estimated cost of $0.50 per mile. Staff also looked at the current fees associated with these training courses and the fees charged to take the exam.

The 1997 IGP did not explicitly require training nor did the State Water Board offer a cost-effective training alternative. To properly develop a SWPPP in compliance with BAT/BCT and to conduct adequate monitoring activities, dischargers could either (1) hire a consultant, (2) join group monitoring, (3) hire an employee with adequate environmental experience, (4) attend a training class conducted by third party vendors, or (5) become knowledgeable through self-training and research. Though the costs associated with each of the above options differ, staff believes that, for most dischargers, these costs are higher than those of the proposed QISP training. Therefore staff set the dollar amount for training for compliance with the 1997 IGP equal to the draft 2012 IGP but assumed there would be some additional labor costs.

In addition to the training required for QISPs, QSD/QSPs, and SWPPP developers, State Water Board staff included time estimates for employee and supervisor permit and SWPPP compliance training. Staff recognizes that the actual employee and supervisory trainings may be reoccurring events but staff estimated the total hours for training during the permit term and estimated these costs as a one-time cost for the establishment of a training program.

**Table 1 - Estimated Training Costs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Cost in Dollars** | | **Additional Time Costs** | |
| **Permit/Draft** | **Low** | **High** | **Low** | **High** |
| 97-03-DWQ | $457 | $1,850 | 23 hrs | 200 hrs |
| 2011 Draft | $1,414 | $2,557 | 50 hrs | 171 hrs |
| 2012 Draft | $457 | $1,850 | 14 hrs | 155 hrs |

### Permit Registration (excludes permit fee)

Permit registration requirements in the draft 2011 and 2012 IGPs dictate that dischargers submit PRDs via the Storm Water Multiple Application and Report Tracking System (SMARTS). Estimates for permit registration were made by talking to SMARTS staff, Regional Water Board staff, and dischargers who have gone through the process of applying for permit coverage under the CGP. The CGP requires online registration like the proposed drafts. Some dischargers are already registered in SMARTS and are familiar with the system. The low time estimates represent these types of dischargers. The high costs represent people new to the SMARTS system and people who may have more complex facilities.

**Table 2 - Estimated Permit Registration Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | 2.5 hrs | 5 hrs |
| 2011 Draft | 4 hrs | 12 hrs |
| 2012 Draft | 4 hrs | 12 hrs |

### SWPPP Development

All permits/drafts require dischargers to develop and implement storm water pollution prevention plans (SWPPPs) that include BMPs that will achieve BAT/BCT and comply with water quality standards. Staff’s estimates for SWPPP development costs were based on discussions with consultants and dischargers who prepare these plans, as well as online research. These estimates are for the development of a new SWPPP. Many dischargers already have a SWPPP and may not need to create a completely new SWPPP for the proposed permit therefore these costs may not be incurred by all dischargers under a newly adopted permit.

**Table 3 - Estimated SWPPP Development Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | $5,000 | $10,000 |
| 2011 Draft | $5,000 | $10,000 |
| 2012 Draft | $5,000 | $10,000 |

### Equipment (pH/EC Meter & Rain Gauge)

Permit requirements mandate that dischargers purchase certain equipment for sampling and measuring rainfall (pH meter, EC meter, & rain gauge). Staff performed an internet search for the pricing of appropriate equipment for compliance. A low and a high range were not presented for this equipment because staff determined that these are the minimum costs associated with these equipment and any additional costs would not be a permit requirement. Order 97-03-DWQ did not specifically require dischargers to purchase a pH meter, EC meter, or rain gauge but allowed dischargers to analyze storm water samples with an EC meter and/or a pH meter. Staff determined that using a pH meter and EC meter for analyzing storm water samples under Order 97-03-DWQ represented the minimum cost requirement for these parameter because a one-time up front capital cost for these meters would be less expensive than the laboratory analytical costs for these parameters for each storm water sample from each sampling event throughout the permit term. The draft 2011 IGP required a pH meter, an EC meter, and a rain gauge therefore the associated cost for equipment was the highest under this draft. The draft 2012 IGP removed the requirement to sample for EC therefore the cost for an EC meter was removed from the cost estimate and only includes a pH meter and a rain gauge. Staff recognizes that other equipment may be purchased by dischargers but these equipment purchases vary widely from site-to-site and are not specifically required under the various permits/drafts thus cost estimates were not determined for other equipment purchases.

**Table 4 - Estimated Equipment Costs**

|  |  |
| --- | --- |
| **Permit/Draft** | **Cost** |
| 97-03-DWQ | $190 |
| 2011 Draft | $390 |
| 2012 Draft | $350 |

### Install Treatment/Structural Control BMPs

Costs for structural/treatment control BMPs will vary significantly from site-to-site and therefore a somewhat large range of cost estimates is presented. Much of the structural/treatment control BMP cost data for this analysis came from Chapter 6 (Costs and Benefits of Storm Water BMPs) of US EPA’s Preliminary Study Report on Urban Storm Water BMPs[[2]](#footnote-3). The study includes information on BMPs such as infiltration devices, ponds, filter strips, and constructed wetlands. Since the report was prepared in 1999, State Water Board staff used an online inflation calculator[[3]](#footnote-4) to bring the cost estimates in that report up to current values. A table of BMPs and their approximate construction and Operation and Maintenance (O&M) costs is presented below and in the companion IGP Costs Analysis Spreadsheet document. State Water Board staff used the least costly options below (installation and O&M costs) for the low range of structural/treatment control BMP costs (grass swales and filter strips). The high range structural/treatment control BMP O&M costs were obtained from sand filter O&M estimates and the high range installation cost came from the estimates for media filtration BMPs.

Cost data for media filtration BMPs were obtained from the State of Washington’s Economic Impact Analysis on their NPDES General Permit for Boatyards (WA Boatyard Permit Economic Analysis) . Boatyards are industrial facilities that need to obtain permit coverage under the IGP in California. Washington’s NPDES General Permit for Boatyards contains benchmark concentrations for storm water that are typically not achievable without treatment BMPs. The WA Boatyard Permit Economic Analysis looked at three different treatment systems, but based on cost and performance data, they assumed that the Stormwater Rx® system would be installed at most sites. State Water Board staff agrees with this assumption, therefore the highest capital construction cost estimate for these systems was chosen for the high range of treatment/structural BMP installation costs. The WA Boatyard Permit Economic Analysis contained cost estimates for this type of media filtration BMP that were based on actual installations at seven boatyards in the state. O&M costs were also included in the WA Boatyard Permit Economic Analysis and these estimates were used in the IGP Costs Analysis Spreadsheet. It is important to note that these cost estimates do not include site re-grading/retrofit costs but only represent installation and construction costs.

**Table 5 - Estimated Structural/Treatment Control BMP Costs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **Annual Maintenance Cost** | |
| **BMP Type** | **Typical Cost ($/BMP) 1** | **Application** | **Cost Based on Inflation 2** | **Annual Maintenance % of Construction Cost** | **Low** | **High** |
| Retention Basin | $100,000 | 50-Acre Site  (Impervious Cover = 35%) | $129,592 | 3%-6% | $3,888 | $7,775 |
| Wetland | $125,000 | 50-Acre Site  (Impervious Cover = 35%) | $161,989 | 3%-6% | $4,860 | $9,719 |
| Infiltration Trench | $45,000 | 5-Acre Site  (Impervious Cover = 65%) | $58,316 | 5%-20% | $2,916 | $11,663 |
| Infiltration Basin | $15,000 | 5-Acre Site  (Impervious Cover = 65%) | $19,439 | 1%-10% | $972 | $3,888 |
| Sand Filter | $35,000- $70,0004,5 | 5-Acre Site  (Impervious Cover = 65%) | $45,357 - $90,714 | 11%-13% | $4,990 | $11,793 |
| Bioretention | $60,000 | 5-Acre Site  (Impervious Cover = 65%) | $77,755 | 5%-7% | $3,888 | $5,443 |
| Grass Swale | $3,500 | 5-Acre Site  (Impervious Cover = 35%) | $4,536 | 5%-7% | $227 | $318 |
| Filter Strip | $0-$9,0005 | 5-Acre Site  (Impervious Cover = 35%) | $0 - $11,663 | $415/acre (maintained) | $104 | $415 6 |
| Media Filtration | $91,400 - $182,8005 | Based on installation costs at 7 Boatyards in Puget Sound, WA | $92,862 - $185,725 | na | $3,556 | $7,112 |

**Source:** Typical BMP costs and Annual Maintenance % of Construction Costs (except for Media Filtration) were obtained from EPA's Preliminary Study of Urban Stormwater BMPs (http://water.epa.gov/scitech/wastetech/guide/stormwater/). Cost Estimates for Media Filtration BMPs were obtained from the Economic Impact Analysis performed by the State of Washington for their NPDES General Permit for Boatyards.

1. Costs do not include land costs or costs to regrade/retrofit site. Costs represent typical construction/installation costs.

2. Inflation was calculated with an online inflation calculator located at http://www.westegg.com/inflation/infl.cgi. The method uses Consumer Price Index statistics and data from the annual Statistical Abstracts of the United States

3. Typical costs were presented in 1999 dollars (except for Media Filtration, 2009) and were adjusted to 2010 dollars.

4. Additional contigency costs can typically be determined by increasing these costs approximately 30%.

5. A range is given to account for design variations.

6. Assumes small site would have 0.25 acres of filter strip to be maintained and large site would have up to 1 acre.

All three permits/drafts (Order 97-03-DWQ, draft 2011 IGP, and draft 2012 IGP) require facilities to install structural/treatment control BMPs where needed to meet BAT/BCT and/or water quality standards. Many existing facilities have already installed some structural/treatment control BMPs. Costs for installation have been included in the One-Time Costs for permit compliance for all three permits/drafts even though these costs may not be incurred by everyone. Under the draft 2011 IGP and the draft 2012 IGP, facilities are required to install additional structural/treatment control BMPs if NALs are exceeded and it is determined that they are not implementing BAT/BCT. These additional costs have been included in the cost analysis under Exceedance Dependent Costs. It is possible however to be in compliance with the IGP and not have to install these types of BMPs.

**Table 6 - Estimated Structural/Treatment Control BMP Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | $4,536 | $185,725 |
| 2011 Draft | $4,536 | $185,725 |
| 2012 Draft | $4,536 | $185,725 |

## Yearly Costs

Yearly costs represent reoccurring expenses that are paid every year. These include labor associated costs for sample collection, operational source control BMPs, Annual Report preparation/submittal, visual observations, and recordkeeping. Also incurred annually are expenditures for laboratory sample analysis, structural/treatment control BMP O&M, and permit fees.

### Sample Collection

The California Stormwater Quality Association (CASQA) submitted cost information in regards to sampling and analysis with their comments[[4]](#footnote-5) on the draft 2011 IGP. Many of CASQA’s assumptions were used for estimating the time required to sample storm water discharges. These assumptions and a breakdown of staff’s calculations for determining sample collection times are included in the companion IGP Costs Analysis Spreadsheet. Time estimates include other tasks besides simple collection of storm water samples in bottles such as filling out Chain of Custody forms, sample delivery to the laboratory, input of result into SMARTS, pre-sampling mobilization, and post-sampling equipment cleaning. The amount of time it takes to sample will vary from site-to-site and will increase based on the size of the site and the number of sampling locations.

State Water Board staff queried SMARTS in an attempt to determine the number of sampling locations at a typical facility. Based on the SMARTS query it was determined that approximately 75% of sites (out of approximately 3,500 facilities with outfall data in SMARTS) have only one or two sampling locations. Therefore the low value in the calculated range represents a facility with only one sampling location. The high value selected by staff was 20 sampling locations and represents large facilities such as ports, landfills, or airports which make up less than 25% of facilities enrolled under the IGP.



Figure 1 - Histogram of IGP Facilities in SMARTS and Number of Sampling Locations

Staff multiplied the time estimates by the number of sampling locations and the number of sampling events to get total sample collection time estimates. These time requirements are based on the assumption that a qualifying rain event occurs in all required sampling time periods (i.e. each quarter). Many facilities will not sample this amount because there will not be a qualifying event (i.e. summer). Order 97-03-DWQ required two sampling events (1st event of the wet season plus one additional event in the wet season) and the draft 2012 IGP requires sampling of four qualifying storm events (one per quarter). The draft 2011 IGP required sampling of four qualifying events (one per quarter) but sampling increases with NAL exceedances and the discharger’s associated exceedance response “Level”. Level 2 dischargers were required to sample two qualifying events per quarter (or eight events) and Level 3 dischargers were required to sample all qualifying storm events. For many locations in the State the requirement to sample all qualifying storm events may not actually be an increase from the Level 2 requirement but staff assumed there would be an average increase of two events (10 events total).

**Table 7 - Estimated Sample Collection Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | 12 hrs | 53 hrs |
| 2011 Draft | 24 hrs | 106 hrs |
| \*\*\*Level 2 | 48 hrs | 212 hrs |
| \*\*\*Level 3 | 60 hrs | 265 hrs |
| 2012 Draft | 22 hrs | 94 hrs |

### Sample Analysis

The Department of Defense (DOD) also submitted cost information along with their comments on the draft 2011 IGP. The cost information contained approximate costs for laboratory analysis of storm water samples with a list of parameter-by-parameter cost estimates. State Water Board staff used this cost information for determining analysis costs. The low range of costs was approximated by estimating the analysis costs for only the base parameters in each permit. To estimate the high range of costs, staff looked at the Standard Industrial Classification (SIC) codes to determine which dischargers were responsible for analyzing additional parameters. It was determined that SIC 4953 facilities (Hazardous Waste Facilities) are required to sample 11 additional parameters which was the most of any SIC code and therefore these additional parameter costs where used to estimate the high range costs for analysis. A query of SMARTS found that this represents 230 currently enrolled facilities (approximately 3.8% of the facilities enrolled). Approximately 50% of facilities are not required to sample any additional parameters based on their SIC codes. Some facilities may be required to sample additional parameters based on the facility’s pollutant source assessment and the potential to discharge to an impaired water body but these parameters will vary and rarely will the count of these additional parameters exceed 11.

Staff multiplied these cost estimates by the number of sampling locations and the number of sampling events to get total analysis costs. The number of sampling locations was the same as described above in the Sample Collection section of this report (low = 1, high = 20) and the number of events was dependent on the permit requirements also explained above.

**Table 8 - Estimated Sample Analysis Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | $172 | $13,520 |
| 2011 Draft | $344 | $27,040 |
| \*\*\*Level 2 | $688 | $54,080 |
| \*\*\*Level 3 | $860 | $67,600 |
| 2012 Draft | $344 | $27,040 |

### Structural/Treatment Control BMPs Operation & Maintenance

See the Install Treatment/Structural Control BMPs discussion above (One-Time Costs section) for the method on how these estimates were determined.

**Table 9 - Estimated BMP O&M Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | $104 | $11,793 |
| 2011 Draft | $104 | $11,793 |
| 2012 Draft | $104 | $11,793 |

### Implement Operational Source Control BMPs

Operational source control BMPs include many different practices and procedures performed on a daily basis during facility operations. Time requirements for these operational activates vary widely from site-to-site and from industry-to-industry. Staff estimated that at a minimum one hour per day is dedicated to these operational source control BMPs. To capture the wide variability between sites, Staff multiplied this minimum one hour per day by a factor of four to estimate the high range of the time requirements for these activities. It was assumed that a year consists of 250 working/operating days.

**Table 10 - Estimated Operational Source Control BMP Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | 250 hrs | 1000 hrs |
| 2011 Draft | 250 hrs | 1000 hrs |
| 2012 Draft | 250 hrs | 1000 hrs |

### Annual Report

Annual Report estimates were based on staff’s experience, discussions with dischargers, and discussions with Regional Water Board enforcement staff. Under the draft 2011 IGP and the draft 2012 IGP, dischargers are required to submit Annual Reports through SMARTS. Dischargers enrolled under the CGP are also required to submit Annual Reports through SMARTS therefore staff’s estimate was also based on CGP related information. Order 97-03-DWQ did not require online submittal of Annual Reports (optional) so the time estimates were slightly less under this permit.

**Table 11 - Estimated Annual Report Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | 3 hrs | 12 hrs |
| 2011 Draft | 4 hrs | 13 hrs |
| 2012 Draft | 4 hrs | 13 hrs |

### Visual Observations

To estimate time associated with visual observations, staff listed all of the required visual observations and inspections under each permit/draft along with the required frequency. Based on staff’s experience, comments on previous drafts, and discussions with Regional Water Board enforcement staff, State Water Board staff approximated the time it would take to perform each observation/inspection at an average facility. State Water Board Staff then tried various multipliers to approximate the time needed at larger or more complex facilities. Staff found that a multiple of four was a close approximation of what staff believes might represent the additional time requirements for these larger or more complex facilities. Under the draft 2011 IGP the potential visual observation time requirements were substantially increased but have returned to Order 97-03-DWQ levels except for the addition of pre-storm inspections.

**Table 12 - Estimated Visual Observations Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | 11 hrs | 44 hrs |
| 2011 Draft | 110 hrs | 440 hrs |
| 2012 Draft | 14 hrs | 56 hrs |

### Recordkeeping

Staff received various comment on the draft 2011 IGP specifying that recordkeeping requirements would be time consuming. Little information was available for determining accurate recordkeeping time requirements therefore Staff included an estimated low range of one hour per year and a high range of four hours per year for recordkeeping requirements under Order 97-03-DWQ and draft 2012 IGP. The draft 2011 IGP required discharger to keep track of all rain events that were not qualifying storm events therefore the recordkeeping time requirements were increased by two hours. This requirement does not exist in the most current draft.

**Table 13 - Estimated Recordkeeping Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | 1 hr | 4 hrs |
| 2011 Draft | 3 hrs | 6 hrs |
| 2012 Draft | 1 hr | 4 hrs |

### Permit Fee

The permit fee cost is based on the current annual fees and is the same for all permits/drafts (no range).

**Table 14 - Permit Fee Costs**

|  |  |
| --- | --- |
| **Permit/Draft** | **Cost** |
| 97-03-DWQ | $1,359 |
| 2011 Draft | $1,359 |
| 2012 Draft | $1,359 |

## Exceedance Dependent Costs

Order 97-03-DWQ required dischargers to modify BMPs in an iterative fashion but a clear end point was not established which made determinations of permit compliance fuzzy. The draft 2011 IGP and draft 2012 IGP both proposed a system of “Levels” for guiding the iterative process of BMP implementation which would give dischargers a clearer path to permit compliance. The draft 2011 IGP consisted of three levels while the draft 2012 IGP contains two levels. Dischargers are required to perform certain tasks in each level, referred to as Exceedance Response Actions or ERAs in the draft 2012 IGP and Corrective Actions in the 2011 draft IGP.

### Level 1 Status

Under the draft 2011 IGP and draft 2012 IGP dischargers are placed in Level 1 status after sampling results indicate an NAL exceedance. The requirements for Level 1 dischargers are listed below along with the associated cost estimates.

#### Evaluate Operational Source Control BMPs

Once elevated to Level 1 status dischargers must evaluate the effectiveness of their operational source control BMPs. Evaluation of operational source controls for a small site can be a simple task especially if BMPs are effective. For a more complex site, staff believes that up to a week’s worth of time may be required to determine if these procedures are effective.

**Table 15 - Estimated Level 1 Evaluation Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | NA | NA |
| 2011 Draft | 4 hrs | 40 hrs |
| 2012 Draft | 4 hrs | 40 hrs |

#### Prepare Level 1 ERA Report

Time estimates for Level 1 ERA Report preparation include writing of the report and upload into SMARTS. Preparation of a Level 1 ERA Report can be a simple task if operational source control BMPs are determined to be effective. Staff’s estimate of four hours for the low time estimate assumes that BMPs were determined effective. The high time estimate assumes that more work is needed to modify operations in order for these BMPs to be effective and that more time is required to write up these modifications. The majority of the work for Level 1 will be completed in the evaluation process as reported above. These reports are much simpler and less time consuming than the Level 2 Technical Report.

**Table 16 - Estimated Level 1 ERA Report Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | NA | NA |
| 2011 Draft | 4 hrs | 16 hrs |
| 2012 Draft | 4 hrs | 16 hrs |

#### SWPPP Update

Time estimates for Level 1 SWPPP updates are based on the assumption that information to be included in the SWPPP will have already been gathered and prepared in the Level 1 ERA Report. These estimates include time for inclusion of the Level 1 ERA Report results into the SWPPP and subsequent upload into SMARTS.

**Table 17 - Estimated Level 1 SWPPP Update Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | NA | NA |
| 2011 Draft | 2 hrs | 8 hrs |
| 2012 Draft | 2 hrs | 8 hrs |

### Level 2 Status

Under the draft 2011 IGP and draft 2012 IGP dischargers are placed in Level 2 status after sampling results indicate a second NAL exceedance for the same parameter that put them in Level 1 status. The requirements for Level 2 dischargers are listed below along with the associated cost estimates.

#### Evaluate Need for Treatment/Structural Control BMPs

Evaluating the need for these types of BMPs is more complex than the Level 1 evaluation therefore larger time estimates and variability were assumed. Tasks may include sampling BMP effluent, sampling for background concentrations, and/or performing a BAT/BCT cost analysis.

**Table 18 - Estimated Level 2 Evaluation Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | NA | NA |
| 2011 Draft | 40 hrs | 240 hrs |
| 2012 Draft | 40 hrs | 240 hrs |

#### Prepare Level 2 ERA Technical Report

Time estimates for this task include preparation of the Level 2 ERA Technical Report and subsequent upload into SMARTS. The majority of the work for the Level 2 ERA Technical Report will be completed in the evaluation process as reported above. Much of the information will have been collected and gathered in the evaluation process. Staff estimated a high range time requirement to prepare the report of up to a week’s time. The low range of four hours was estimated as the time it would take to prepare a report documenting that treatment/structural control BMPs are not needed for a relatively small site.

**Table 19 - Estimated Level 2 ERA Technical Report Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | NA | NA |
| 2011 Draft | 4 hrs | 40 hrs |
| 2012 Draft | 4 hrs | 40 hrs |

#### Implement Additional Structural/Treatment Control BMPs

Costs to implement additional structural/treatment control BMPs are estimated to be the same as the initial costs presented above in the One-Time Costs section. Not all facilities will have to implement additional BMPs. Dischargers may decide to prepare ERA Level 2 Demonstrations (e.g. BAT/BCT Compliance Demonstration, Non-Industrial Source Pollutant Demonstration, and/or Natural Background Demonstration) in lieu of implementing additional structural/treatment control BMPs. It is assumed that the Discharger will only prepare these demonstrations if they are less costly than implementing additional structural/treatment control BMPs therefore a cost analysis was not performed for the preparation of these ERA Level 2 Demonstrations.

**Table 20 - Estimated Additional Structural/Treatment Control BMPs Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | NA | NA |
| 2011 Draft | $4,536 | $185,725 |
| 2012 Draft | $4,536 | $185,725 |

#### Additional BMP Operation & Maintenance (Annual O&M)

Along with the construction and installation costs for structural/treatment control BMPs are yearly O&M costs. These costs are assumed to be the same as presented in the Yearly Costs section above and will not be incurred by everyone as explained in the Implement Additional Structural/Treatment Control BMPs section above.

**Table 21 - Estimated Additional BMPs O&M Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | NA | NA |
| 2011 Draft | $104 | $11,793 |
| 2012 Draft | $104 | $11,793 |

#### Increase Sample Collection / Analysis (twice per quarter annually)

The draft 2011 IGP required dischargers to increase their sampling frequency to two events per quarter. Staff calculated the approximate cost to collect samples (in hours) and costs to analyze samples (in dollars) for one event then multiplied these costs by eight events.

**Table 22 - Estimated Level 2 Sample Collection/Analysis Increase Costs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Cost in Dollars** | | **Additional Time Costs** | |
| **Permit/Draft** | **Low** | **High** | **Low** | **High** |
| 97-03-DWQ | NA | NA | NA | NA |
| 2011 Draft | $688 | $54,080 | 48 hrs | 212 hrs |
| 2012 Draft | NA | NA | NA | NA |

#### SWPPP Update

Time estimates for Level 2 SWPPP updates are based on the assumption that information to be included in the SWPPP will have already been gathered and prepared in the Level 2 ERA Technical Report. These estimates include time for inclusion of the report results into the SWPPP and subsequent upload into SMARTS.

**Table 23 - Estimated Level 2 SWPPP Update Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | NA | NA |
| 2011 Draft | 2 hr | 8 hrs |
| 2012 Draft | 2 hr | 8 hrs |

### Level 3 Status

The draft 2011 IGP is the only permit/draft that contained Level 3 requirements. The requirements for Level 3 dischargers are listed below along with the associated cost estimates. Once in Level 3, the NALs became NELs and dischargers were required to sample all qualifying storm events and modify their SWPPP accordingly. The cost for an exceedance of an NEL would have been $37,500 per day. It is not possible to determine what facilities, how many facilities, and how many times a facility would have exceeded these NELs therefore a cost analysis based on the imposition of NELs was not performed. An analysis of costs was performed based on the increase in sampling and an additional SWPPP update.

#### Increase Sample Collection / Analysis (all storm events)

The draft 2011 IGP required dischargers in Level 3 to increase their sampling frequency to all eligible qualifying storm events. For many locations in the State the requirement to sample all qualifying storm events may not actually be an increase from the Level 2 requirement (eight events/two per quarter) but staff assumed there would be an average annual increase of two events (10 events total). Staff calculated the approximate costs to collect samples (in hours) and costs to analyze samples (in dollars) for one event then multiplied these costs by ten.

**Table 24 - Estimated Level 3 Sample Collection/Analysis Increase Costs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Cost in Dollars** | | **Additional Time Costs** | |
| **Permit/Draft** | **Low** | **High** | **Low** | **High** |
| 97-03-DWQ | NA | NA | NA | NA |
| 2011 Draft | $860 | $67,600 | 60 hrs | 265 hrs |
| 2012 Draft | NA | NA | NA | NA |

#### SWPPP Update

Time estimates for Level 3 SWPPP updates are based on the assumption that most of the information to be included in the SWPPP update will have already been available in the site’s monitoring plan but the frequency of monitoring will be increased. These estimates include time for modifications to the monitoring plan in the SWPPP and subsequent upload into SMARTS.

**Table 25 - Estimated Level 3 SWPPP Update Costs**

|  |  |  |
| --- | --- | --- |
| **Permit/Draft** | **Low** | **High** |
| 97-03-DWQ | NA | NA |
| 2011 Draft | 2 hrs | 8 hrs |
| 2012 Draft | NA | NA |

# Discussion

In order to understand the economic impact on dischargers of the proposed draft permit, staff performed additional analysis with the cost estimate data presented above. A summary of the above cost estimates has been included as [Appendix 1](#Appendix1bookmark).

## Distributed Costs Analysis

Staff performed an analysis of the total costs for each IGP and then distributed the costs to all facilities. We are calling this the Distributed Cost Analysis, which is meant to be an estimate and measure of the fiscal impact of the IGP on all California industrial facilities subject to the IGP. In this analysis total annual compliance costs for each permit/draft are compared. To capture the total cost of compliance for each permit/draft, it was necessary for staff to assume probabilities for each line item cost estimate. The low cost and the high cost estimates where distributed in an attempt to determine costs associated with the majority of facilities in California. Most costs were given a 50/50 probability meaning 50% will pay the low cost and 50% will pay the high cost except for the installation of structural/treatment control BMPs which was given a 95/5 probability. Sample collection and analysis cost estimates were not assigned percentages but were calculated based on the information gathered from SMARTS that most facilities have no more than two sampling location and will not have to analyze any additional parameters beyond the base parameters.

Time cost estimates were assigned a labor wage of $75 per hour which is an approximate average labor wage for facility staff and hired help. For Exceedance Dependent Costs, each level was assigned a probability of exceedance (assuming that more facilities will exceed Level 1 than Level 2 and even less for Level 3). This analysis also assumes that most dischargers who trigger the Exceedance Dependent Costs process will go through the process only once although it is possible that a discharger may go through it more than once.

One-time capital costs were annualized based on economic equations for annualizing present values with an assumed 5% interest/inflation rate and a 10 year term. The 10 year term is based on the assumption that BMPs will have a life span of 10 years and that permit requirements will not change significantly in that time. Annual costs were then totaled to get the Equivalent Uniform Annual Cost (EUAC) for each permit. A percent increase from the 1997 IGP was calculated for the draft 2011 and 2012 IGPs and a percent decrease from the draft 2011 IGP was calculated for the draft 2012 IGP. The results for this distributed costs analysis are presented below and show that costs for the draft 2012 permit will increase for industry as a whole by approximately 7% if 50% of dischargers enter Level 1 and 25% of dischargers enter Level 2 (the draft 2012 IGP does not contain Level 3 requirements).

Table 26 - Distributed Costs Analysis Summary

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IGP Cost Summary | Draft 2012 | Draft 2011 | | 1997 IGP | |
|  |  |  | |  | |
| One Time Costs | $24,614 | $27,596 | | $31,243 | |
| Yearly Costs | $29,548 | $47,848 | | $27,816 | |
| Level 1 Exceedance Probability 50% | $1,388 | $1,388 | | $0 | |
| Level 2 Exceedance Probability 25% | $6,702 | $8,171 | | $0 | |
| Level 3 Exceedance Probability 15% | na | $1,652 | | $0 | |
| Equivalent Uniform Annual Cost (EUAC) | $33,968 | $53,166 | | $31,862 | |
| **Percent Increase from 1997 IGP** | 7% | 66.86% | |  |  |
| **Percent Decrease from 2011 Draft** | 57% |  |  |  |  |

The percentages in Table 26 above represent Staff’s best estimate of the probability of exceedances but a sensitivity analysis was also performed. Various percentages of exceedances were used to calculate the change in costs and the relative impact to industry. Results of this analysis are presented in Figure 2 below. Since the Distributed Costs Analysis is largely speculative, the sensitive analysis is a useful tool to help determine the accuracy of the estimated average increase in costs of the proposed draft IGP.

Figure 2 - Sensitivity Analysis of Distributed Costs Calculations

## Low/High Annualized Costs

A second analysis performed by staff to help quantify changes in compliance costs was a Low/High Annualized Costs summary. Time cost estimates were assigned a labor wage of $75 per hour which is an approximate average labor wage for facility staff and hired help. All one-time capital costs were annualized (including applicable Exceedance Dependent Costs) based on economic equations for annualizing present values with an assumed 5% interest/inflation rate and a 10 year term. The 10 year term is based on the assumption that BMPs will have a life span of 10 years and that permit requirements will not change significantly in that time.

Annual costs were then totaled based on two scenarios. The first scenario assumes that a discharger does not trigger any of the exceeedance levels representing the best case scenario. The second scenario assumes that a discharger triggers all exceedance levels under the applicable draft (Levels 1 and 2 for the draft 2012 IGP and Levels 1, 2, and 3 for the draft 2011 IGP) representing the worst case scenario. This analysis also assumes that most dischargers who trigger the Exceedance Dependent Costs process will go through the process only once although it is possible that a discharger may go through it more than once.

A low/high percent increase from the 1997 IGP was calculated for the draft 2011 and 2012 IGPs and a percent decrease from the draft 2011 IGP was calculated for the draft 2012 IGP. Results for this Low/High Annualized Cost analysis are presented below and show that annual compliance costs for the draft 2012 IGP would increase from approximately 5% to 12% if a discharger has no exceedances and from 10% to 41% if the discharger triggers all levels. The draft 2011 IGP showed a 67% to 97% increase in estimated costs if all levels were exceeded.

Table 27 - Low/High Annualized Costs Analysis

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Low/High Annualized Cost Summary | Draft 2012 | | Draft 2011 | | 1997 IGP | |
|  | Low | High | Low | High | Low | High |
| One Time Costs (Annualized) | $1,494 | $27,233 | $1,993 | $27,505 | $1,587 | $27,622 |
| Yearly Costs | $23,632 | $127,717 | $31,132 | $157,567 | $22,410 | $110,147 |
| **Total Annual Compliance Costs** | $25,126 | $154,949 | $33,125 | $185,072 | $23,997 | $137,769 |
| **Percent Increase from 1997 IGP** | 5% | 12% | 38% | 34% |  |  |
| **Percent Decrease from 2011 Draft** | 32% | 19% |  |  |  |  |
|  |  |  |  |  |  |  |
| Exceedance Dependent Costs |  |  |  |  |  |  |
| Level 1 | $97 | $622 | $97 | $622 | NA | NA |
| Level 2 | $1,138 | $38,641 | $5,426 | $108,621 | NA | NA |
| Level 3 | NA | NA | $5,379 | $87,553 | NA | NA |
| **Total Annual Compliance Costs** | $26,361 | $194,212 | $44,028 | $381,868 | $23,997 | $137,769 |
| **Percent Increase from 1997 IGP** | 10% | 41% | 83% | 177% |  |  |
| **Percent Decrease from 2011 Draft** | 67% | 97% |  |  |  |  |

# Conclusions

The key findings of this report are as follows:

* Overall, the average annual cost of compliance of the new permit for facilities with no exceedances would increase between 5% and 12% compared to the annual cost of compliance with the 1997 IGP.
* Annual average cost of compliance with new permit depends on multiple factors including size of operations, location and level of exceedances. Staff estimated annual compliance costs for the 1997 IGP to range between $23,000 to approximately $137,000. For facilities with no exceedances, compliance with the draft 2012 IGP will cost between $25,000 and approximately $155,000 annually. Facilities with exceedances would see a more significant increase in costs to bring the facility in compliance. Facilities with Level 1 status (one NAL exceedance) would face an additional annual average cost between $97 and $622. Facilities with Level 2 status (second NAL exceedance for same parameter) would face an additional annual average cost between $1,138 and up to $38,641. Under the draft 2011 IGP, Dischargers with Level 3 status would have faced incremental annual average costs of up to $67,600.
* The annual average cost of compliance with the draft 2012 IGP is approximately half (50% less) of what the draft 2011 IGP originally required.
* The increase in compliance cost would be more significant for those facilities with exceedances. Staff does not expect a significant increase in compliance costs for those facilities with no exceedances.
* Based on staff’s best judgment, the most likely scenario is that 50% of facilities would have no exceedances, 50% of facilities will reach Level 1 status, and 25% will reach Level 2 status. With this assumption, the total annual average compliance cost of the draft 2012 IGP as compared to the 1997 IGP would be increased by 7%.

Appendix 1 - Cost Analysis Workbook



1. Federal Water Pollution Control Act of 1970 (also referred to as the Clean Water Act or CWA), 33 U.S.C. § 1201. All further statutory references herein are to the CWA unless otherwise indicated. [↑](#footnote-ref-2)
2. Located at: <http://water.epa.gov/scitech/wastetech/guide/stormwater/> [↑](#footnote-ref-3)
3. Located at: <http://www.westegg.com/inflation/>

   The method uses Consumer Price Index statistics and data from annual Statistical Abstracts of the United States. [↑](#footnote-ref-4)
4. Scott Taylor, Letter dated April 29,2011 <http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/industrial/igp_cmmnts042911/scott_taylor.pdf> [↑](#footnote-ref-5)