Melvin Oleson

Thank you for the opportunity to comment on the most recent version (in draft) of the Washington State General Stormwater permit for industrial dischargers. My comments below are based on substantial experience in the development and implementation of the current permit from the original ISWGP permit (1996) and additional work on the EPA's multisector General Permit for industrial dischargers. I currently hold a BS in Biology and have certifications from Envirocert Inc. as a Certified Professional in Industrial Stormwater Management (CPISM) and Certified Professional in Stormwater Quality (CPSWQ). I do not have any affiliation with any industrial, environmental, construction or municipal organization which allows me to make my comments based only on the merits of the permit to obtain th Federal Clean Water Act fishable, swimmable water bodies goals. The stormwater community is very fortunate to finally have a rigorous evaluation of the policy and technical challenges facing us all in the National Academy of Sciences study "Improving the EPA Multi-Sector General Permit for Industrial Stormwater discharges" (NAS). I am relying in significant extent for support of my comments on the findings from documentation provided by the National Academy of Sciences report (Pre Release version). Statements in the text of my comments taken from the NAS report are in bold. The report has many issues or relevance to the current effort to renew the ISWGP. I have selected a few of the many issues identified in the NAS report for detailed comment with the intent to demonstrate the need for a "time-o in permit development and serious evaluation of the NAS reports conclusions and recommendations in formulating as successor ISWGP for Washington State. The EPA and Ecology (and other states) shou coordinate their reissuance efforts through in-person and on-line discussions and recommendations. Washington permittees should provide coordinate input on any proposal to Ecology, through the formatic a stormwater advisory committee, potentially lead by the Washington Stormwater Center of Excellence, using the NAS report as a discussion baseline.
While it was my intent is to address the two phases that exist in every Industrial Stormwater General Permit developed since 1995. 1) Policy issues that surround the implementation and impact of the ISGP. Practical science and engineering issues that, in many respects, shape the ISGP design I have found that the two elements are tightly interwoven. Thus, the following comments may have elements of both policy and technology. My thoughts may be identified by the term "take-away"

Summary: WDOE's permit evolution has stalled with the proposed reissuance of the draft permit as it is only a slight modification of the prior two permits. Ecology should extend the existing permit for 1-2 years during which time it evaluates, in conjunction with affected parties, the National Academy of Science report. The targets are to:
1) identify data collection needs to establish effective standards for stormwater pollutant and volume discharges. Include data collection requirements into the permit.
2) Anticipate EPA's 2020 permit development so that Washington State continues to have a leading role in the development of stormwater policy as well as compliance approaches and tools.
3) Consider various tiered approaches to permitting and compliance that minimize adverse impact on business while ensuring acceptable pollutant and volume discharges.
4) Utilize the Washington Stormwater Center of excellence to identify new technology approaches that will reduce the cost to permittees while increasing the quantity and accuracy of data collection.
Content guide:
WDOE Overarching Policy Criteria (preamble)
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Efficient
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Effective Permit Recommendations and observations
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Preamble:
When Congress amended the Clean Water Act to address the impact of non-process stormwater on the nations water quality it recognized that this was not the same as regulations for process water from industrial systems. Thus, certain "allowances" were made to allow the phased in approach to developing the EPA's Multi-Sector General permit and subsequent delegated State level permits. There was a recognition that the stormwater discharges had been largely unregulated and unmonitored. Thus, there was a minimal amount of data available to establish Effluent Limits or for that matter Water Quality B Effluent limits. Thus, an alternative "indicator of potential to adversely impact water quality" was born- the benchmark" It was also recognized that since this new concept did not fit into any existing regula enforcement scheme, thus; it would not be an "enforceable limit" but rather would be used to trigger responses by permit holders. It was the compliance with the permit provisions for actions taken in respor to "exceeding a benchmark" that was the actual area of enforcement. Early permits policy strove to implement this new concept into the original permits. This was a logical policy action as the regulatory sc goal for both WDOE and permittees was to develop an understandable process for identifying problem discharges and providing workable solutions to bring these discharges under a semblance of control. I to the atypical nature of stormwater when compared to typical industrial discharges it was recognized that something different was needed to account for:
1) The unpredictable nature of rain events in both frequency and intensity.
2) The lack of any "stormwater water quality discharge standards" in recognition that application of existing environmental and human health standards was legally and technically unsupportable.
3) A paucity of procedures, processes and equipment to address stormwater quality.
4) Non-existent case law to address the myriad "grey" areas created by the new permits requirements' and impact on environment.
5) The existence of massive areas of impermeable ground (i.e.: pavement, roofs) that contributed to excess flows into receiving streams. The result of which were flooding and destruction of wildlife habitat property.
That was all applicable then and resulted in early stormwater permits that used a variety of workarounds to allow transition by industry and WDOE into a more rational process. This culminated in a series o legislative bills and Pollution Control Board decisions that provided a framework for the next generation of industrial permits. Fortunately, WDOE took a constructive approach to enforcement with the inte moving industry into compliance with the permits through education and technical support. The legislature also created the Washington State Stormwater Center of Excellence to, among other activities, identify functional processes and equipment that could be used by permittees to limit pollution discharges and support flow control.
There have been 24 years in the making of the factors that are to be addressed in the next generation of ISWGP. My analysis is that the permit that is proposed is a failure in the evolution of the permit proce toward the goal of water quality
As stated in the NAS report: " Although the 1995 MSGP was based on sound scientific and public policy principles, the committee found that many of the program elements have been hampered by shortfal in generating, considering, and acting upon new information. This has resulted in missed opportunities for refining the MSGP monitoring requirements in support of improved stormwater management. In th report, the committee recommends updating MSGP benchmark monitoring requirements and thresholds using a periodic review process to incorporate the latest science and monitoring information into eacl permit revision" .
Take-away: The Washington State permit continues to be constrained in its ability to address stormwater related water quality because this permit continues the interim policy of attempting to solely use "benchmarks" to assess the impact of the industrial discharges on the receiving waters of the state. As noted in the NAS statement a periodic review to incorporate the latest science is needed- and this permi fails that goal.
A bit more background may clarify how the permit was intended to evolve into a tool that could actually and categorically determine what needed to be done to address the states stormwater quality issues. The current permit was an interim step in an evolutionary plan to achieve three goals. These goals were agreed on with WDOE, Industry, and Environmental groups during legislative actions creating the stormwater RCW. The agreed aspects were that the permits would evolve to be:
1) Effective: This means that the permit would have the results of reducing pollution from industrial discharges to levels consistent with state water quality standards. Within this goal was the intent that met would be developed that allowed the irregular discharge in both time and flow to be calculated so that the permittee was not placed in an impossible position of controlling the discharge to exacting standard they would be for a continuous process flow. Rather, the cumulative impact of their discharge would be considered in context of the receiving waters ability to receive it. It would also consider the impact of flow rates on the receiving waters as a means to protect wildlife (especially salmon spawning grounds).
Take-away: Current Status: During questioning at the Moses Lake permit hearing and after researching the (nearly incomprehensible) WDOE web site it became obvious that WDOE does not have anywher near sufficient information to determine what-if any- impact any particular discharge is having on any specific receiving water. Even taken at a regional or statewide level it appears there is insufficient usea information to determine mass loading discharges to receiving waters. In effect; there appears to be no understanding if the extensive work done to protect the states waters has achieved the goal or at least s portion of it. The NAS report makes clear that knowing the impact of Stormwater is a key goal:
"NAS: The primary purpose of the MSGP monitoring program is to ensure that industries are complying with the terms of the permit and appropriately managing stormwater on site to minimize discharges harmful stormwater pollutants to the local environment"
In large part this is because WDOE permits have not been upgraded to collect additional information that is critical to understanding stormwater discharge- key among these is discharge flow/volume and receiving water flow/volume and pollutant load. For specific pollutants other factors also need to be collected.
2) Efficient: The intent here was that the permit would prescribe action by industrial users that were the least cost method of pollution and flow control consistent with obtaining the desired water quality standard. Embedded in this notion was that the permittee would have a selection of approved options from WDOE (The stormwater manuals) which were guidance but not regulatory requirements. These guidance documents could be used at any stage of the permittees efforts to comply and were presumed to be acceptable when used in corrective actions as dictated by the permittee when exceedances of benchmarks trigger a corrective action. The permittee could also use alternate processes and equipment if it the design and implementation meet WDOE approval.
Take-away: Current State: WDOE has done a commendable job of creating two manuals containing a bewildering array of options and recommendations for both pollutant and flow control. The Washingto Stormwater Center of Excellence has been active in evaluating additional stormwater control measures (SCM) for use. The problem that industry has is they really don't know which of the SCMs, if any, are needed to manage their stormwater to meet the desired water quality standards. This again goes back to the permit's failure to collect the needed data from the permittees (pollutant concentrations and discha flows/volume) and the States failure to provide information on the receiving waters (flow/volume and pollutant loadings) at the time the permittee discharges. Without this very basic information it is quite

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possible that many industries are spending excessive amounts to install SCM that are not needed while others may unwittingly be causing problems even though they are meeting the "synthetic" benchmark standards. Wasted time, money and depressed economic opportunity are all outcomes of failure to have the needed data sets to know what is happing to our receiving waters.
3) Enforceable: The original and subsequent permits were constructed such that it had a clear and precise set of "rules" that could be enforced against by WDOE when they were violated. Due to the use of synthetic standards (benchmarks) and the high levels of variability in site specific conditions it has proven difficult. WDOE has found that violations of either the reporting requirements or the compliance w the corrective action's provisions are the most tenantable enforcement actions. I was unable to find any direct water quality enforcement actions in WDOE's (very difficult to use) web site. The challenge of enforcement against synthetic standards (benchmarks) and focus on reporting/corrective action compliance may have had a role in WDOE enforcement program's focus on helping permittees come into compliance with permit provisions rather than with water quality standards- actually, WDOE has no way to enforce compliance as the ability to determine water quality non-compliance is impossible with tl information available under terms of the permit.
Take-away: Current State: Unenforceable? How can that be? The answer lies in the basic underlying fallacy in the permit that compliance with benchmarks (a synthetic standard) is the same as compliance water quality standards. The underlying cause of this problem is that permittees are not required to collect enough information to make a determination if they are complying with existing water quality standards. Also, there is insufficient technical information to develop effluent limits or wet weather water quality based effluent limits. As noted above, and repeated for emphasis, the information needed to make basic determination are:
1) discharge pollutant content
2) discharge flow rate/volume
3) receiving water pollutant loading
4) receiving water flow rate/volume
5) For selected pollutants other factors such as hardness, pH or salinity may impact the calculations.
6) Unique to stormwater is frequency of discharge as well as flow rates/volume.
The benchmark system only collects one of these factors "discharger "pollutant loading". Which has incomplete relevance to actual impact on the receiving waters as it can not be converted into an actual impact on water quality standards without the additional listed information. This benchmark is supposed to be an indicator or the "potential" to cause a violation of a water quality standard, and in reality, without additional information, it fails in that role as noted by NAS. WDOE has well documented how this benchmark standard was developed and what factors they included. Yet, an "indicator of potential violate water quality standards" is not in and of itself an enforceable value- as it doesn't much when applied to real world circumstances. As noted in the NAS report below the sampling method, normally a "single grab" injects such a high error rate as to make the data highly suspect in essential calculations.

As a policy issue the NAS comments:
Because of the paucity of rigorous industrial SCM performance data, the development of new numeric effluent limitations (NELs) is not recommended for any specific sector based on existing data, data ga and the likelihood of filling them. Any new NEL that is developed would require extensive new data collection
(and thus)
EPA should update and strengthen industrial stormwater monitoring, sampling, and analysis protocols and training to improve the quality of monitoring data.

Hence, WDOE's permits lack of the requirement to collect even the most basic flow/volume data results in a total inability to establish standards that define a water quality problem and how it should be addressed. It further complicates the compliance issue in that the permittee may be arbitrarily required to employ extensive and expensive corrective actions when none- or a lesser degree- may be needed.
Take-away 1: The above discussion outlines why the currently proposed ISGP is neither:
Effective: without the relevant and necessary data we actually have no idea if all the work and funds being expended are helping meet water quality standards. We hope it is; but as noted in a quip: Hope is N a best management practice (BMP).
Efficient: without knowing what level of pollutant removal is needed industry is forced to take actions based on an arbitrary set of rules under the permits compliance protocol. Which may or may not be wh needed to attain the actual desired standard. Thus, it is very possible that some industry permittees are wasting significant funds for no or minimal gain while others may be causing water quality problems b are not being required to take action as they meet the synthetic standards of a benchmark.
Enforceable: If there is one thing that gets people angry it is the enforcement of arbitrary (and complex) paperwork rules to the exclusion of enforcement on the actual problem areas cleaning up our water bodied. WDOE needs to have much greater data set to determine what level of impact industry and specific dischargers are having on the receiving waters of the state.
Take-away 2: Considering the above it is seeming obvious that the current ISWGP and the proposed successor, which is essentially the same, should be extended for 1-2 years while a new permit is develop that addresses the actual water quality problems potentially caused by the discharges from industrial permittee's facilities. A focus on the issues and concepts included in the National Academy of Science report is an excellent starting point. The short extension of the current permit will suffice while a new effective, efficient and enforceable permit is created in conjunction with the permittees, environmental groups, EPA and other relevant participants. As an adjunct to this new permit there will need to be a streamline mechanism for the use of variances for stormwater permittee who need extended periods of ti achieve compliance, particularly with human health standards as recently revised for pollutants such as PCBs, PAHs and Phthalates. We should also consider narrative standards where appropriate.
Some ideas on what would make an effective permit are as follows.
A: Industry wide monitoring
The NAS report states: EPA should require industry-wide monitoring under the MSGP for pH, total suspended solids (TSS), and chemical oxygen demand (COD) as basic indicators of the effectiveness of stormwater control measures (SCMs) employed on site.
Take-away: Mandatory monitoring of a specific set of discharge measures provides data is needed across the board all permits in all states. This need for consistent data is the basis for 1) comparison of discharges to receiving waters and 2) effectiveness of stormwater control measures (SCM). The overall state of failure to have this data is apparent in the lack of such data for use in developing regulatory li and evaluating SCM's. The precise selection of pollutants to monitor can be debated and may need to include bio accumulative or sediment related discharges such as PCB and PAH. The inclusion of manda reporting of an agreed upon set of pollutants it is an important step in creating a national and state program to have consistent comparable information on "indicators" of SCM effectiveness and permittee discharges.

B: Non-industrial monitoring

However; it may not be enough to collect data only on industrial discharges- as noted in the NAS study:
EPA should update the MSGP industrial-sector classifications so that requirements for monitoring extend to nonindustrial facilities with activities similar to those currently covered under the MSGP. It is recommended that coverage be expanded to non-industrial NAIC codes if they pose a similar threat to water quality
Take-away: Washington has included some of these "similar" facilities in the ISGP; what is missing is data collection from a broader range of sources that are normally considered components of the MS4, Construction and many individual permits. The broader data collection will help define what SCMs work in what applications. Providing permittees in all permits with better and, hopefully, less costly (mor efficient) SCMs than the current hit or miss approach created by lack of good performance data under wide range of conditions. A comparable collection of pH, TSS and COD data from MS4 discharges alo with flow/volume rates would assist in evaluating the impact both industrial and municipal discharges have on the receiving water. Better yet would be MS4 collection of specific pollutant data comparable that required on the basic ISWGP. Collecting data from one class of permittee and ignoring the contribution of others simply skews the results to point they may be unreliable in developing wet weather discharge standards.

C: Event mean concentration:
It is not enough to just collect additional consistent pollutant loading data. An effective data collection system will collect flow/volume data to support the development of Event Mean Concentration (EMC) each discharger. The NAS report discusses this at length, but; a couple of lines from the report provide a basic understanding of the concern:
The difference between concentrations in first-flush runoff and later runoff can be an order of magnitude or more for some pollutants. This is not always the case, however, because changing rainfall intensit during a storm can provide energy mid-storm that may scour the drainage areas and produce high concentrations after the first flush.
Take-away: No one sample is likely to be accurate. A single grab sample has such a high variability in its likelihood of catching a representative sample of the pollutant load that it is in effect worthless (var =125% per report).
NAS statement: A grab sample will always be a snapshot of a rapidly changing situation. Trying to infer an EMC from a grab sample is not scientifically justifiable
This failure of grab samples is driven by flow rates that are affected by factors such as drainage design, pipe diameter, slope, rainfall intensity variation, residuals from prior storms and other factors. To develop anything like a reasonable profile of the pollutant levels and mass of pollutants being discharged requires multiple sample collections over time. Equally important is the determination of flow/volu rates that can be converted into discharge volumes. The need for useful data is well summarized as:
Collection of composite volume-weighted samples over multiple storm events can provide a comprehensive understanding of annual pollutant discharge loads from a site and/or SCM performance over stor of different size. (note the volume-weighted component- i.e. flow).;
Take-away: WDOE needs to revamp it permit data collection requirement to address the development of sufficient information to support development of reasonable standards for permittees compliance. K within these revamped measures are collection of ALL relevant data for making a determination of the impact of a discharge over a period of time on a receiving water. This in effect requires the collection both pollutant levels and volume (flow) levels over an extended period of time. Further, WDOE needs to address ways that industrial dischargers to MS4s have an impact on the ultimate discharge to receivi waters. Concurrently, WDOE must develop a means to provide the permittee with receiving water information timely to their discharges so the impacts can be determined. The use of upstream USGS statio and development of Ecology pollutant measurement stations would be a step toward providing the necessary- time relevant information.

D: First flush
Within this discussion are several references to first flush collection requirements found in many industrial permits. The NAS evaluation is to the point:
The current MSGP requirement for grab samples during the first 30 minutes to capture the first flush is inconsistent with the methods used to derive benchmark thresholds. Technology based MSGP benchm thresholds are derived from Nationwide Urban Runoff Program (NURP) values and secondary treatment requirements. NURP values are calculated from event mean concentrations (EMC) in stormwater discharges that were characterized using composite sampling techniques (EPA, 1983).
Take-away: The current and proposed first flush of fall (September) collection requirement in the ISWGP is as meaningless as any other grab sample, as noted above. This specific requirement should be abandoned as ineffective and inefficient.

E: Wet weather standards/ mixing zones
A further consideration in the need for data collection is the issue of wet weather ELG and WQBEL. The typical ELG/WQBEL is developed on the premise of worst-case condition. That would include the lowest 10-year flow in the receiving water. The NAS report addresses this issue in two related discussions, mixing zones and wet weather standards.
Mixing zones: A related issue is the development of wet weather Effluent Limit Guidelines and Water Quality Based Effluent Limits. By its very nature, industrial stormwater discharges occur during wet

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weather conditions when the receiving stream is expected to be flowing at some reasonable capacity above base flow, which could provide dilution of stormwater discharges. NPDES regulations allow for municipal and industrial process wastewater discharges to incorporate dilution and an impacted mixing zone when evaluating instream toxicity.
AND
Wet Weather Standards: The amount of pollution that a water body can assimilate and still support beneficial use goals is defined through adoption of water quality criteria. Most often, the criteria are pollut specific and numeric and are designed around a low-flow dry weather condition, with the idea that this condition represents the highest pollutant concentration in a water body. However, stormwater flows v occur during quite different flow and loading conditions than those for which the criteria are typically established. Questions have been raised about the applicability and relevance of these criteria to wet we conditions, but separate criteria for wet weather allowances have not been developed and implemented for industrial stormwater discharges.
Take-away: WDOE needs to collect substantial data on pollutant discharge quantity/quality and the impact on the receiving waters in order to conduct the needed evaluation of the use of mixing zones and v weather water quality criteria. The continued use of dry weather criteria creates an inherent excess of restrictive standards, especially for waterbodies covered by 303d designations or dry weather based TM waste load allocations. Since any discharger, including stormwater dischargers, must meet a water quality standard in a 303d listed waterbody- pending development of TMDL, the use of "dry weather" crite in a stormwater context creates a burdensome demand on the permittee. As an interim measure it may be possible to create "narrative standards" of SCM to achieve these standards. These factors could be woven into the development of "synthetic Benchmark standard" for use by groups of dischargers with similar ratios of discharge volume to receiving waters thus providing a "indicator or reasonable potenti pollute" for the water quality pollutant. This could be expanded to a watershed-based benchmark that would more closely attune to the impact of dischargers. Current regulations place a significant burden o the use of mixing zones. This should be revisited with the intention of understanding how the higher flows during stormwater events may be addressed.
AND
There are special cases for developing ELGs and WQBEL or benchmarks. Tidal flows with and without inflowing streams and still waters (lakes, ponds, reservoirs). WDOE needs to develop alternative benchmark/limits for use in these situations. Tidal flows being highly dynamic and bi-directional present a challenge to determine at what point the highest impact to receiving water occurs. Still waters hav low dynamics, yet generally have substantial volume into which a discharge is released.

F: Training
Training as a source control measure.
The lack of mandatory training for personnel collecting stormwater data is tantamount to ripping out an essential source control measure (SCM). This evaluation is supported by the NAS discussion on the subject:
Data and field experience show substantial differences in the reliability of samples collected by facility personnel as compared to trained (watershed agency) personnel (K. Schiff, Southern California Coast Water Research Project, personal communication, 2018). This difference is attributed to the fact that agency personnel are trained in water, wastewater, and stormwater sampling procedures and pollutant transport concepts and have experience with multiple stormwater situations. In contrast, industrial facility staff may not be trained in stormwater concepts or procedures. Inconsistent sampling at a given fac across multiple storms may result from using untrained personnel or by employing different personnel who implement procedures differently. The committee recommends training and guidance, including t possibility of a training/certificate program in stormwater collection and monitoring, to reduce the variation in sampling design and sample collection.

EPA should update and strengthen industrial stormwater monitoring, sampling, and analysis protocols and training to improve the quality of monitoring data.
Training is a problem on several fronts.
Take-away:1
1) Overarching concern is that inaccurate and inconsistent data makes it difficult to justify establishing relevant stormwater standards:
Because of the paucity of rigorous industrial SCM performance data, the development of new numeric effluent limitations (NELs) is not recommended for any specific sector based on existing data, data ga and the likelihood of filling them.
2) Inaccurate data may result in permittee expending significant funds to correct a problem that is more likely a sampling error OR a permittee may not be conducting corrective actions because of errors in t collected data.
3) SCM effectiveness is often determined by the measured ratio of pollutant discharged to that input. Inaccurate data will skew the SCM effectiveness or, worse, totally confuse if the SCM is at all effective.
EPA should update and strengthen industrial stormwater monitoring, sampling, and analysis protocols and training to improve the quality of monitoring data.
Take-away 2: Mandatory training for any person responsible for the sampling and flow measuring efforts must be incorporated into the permit. The training should cover the basics of sampling mechanics f grab and multi-grab or composite sampling. It should provide instructions on how to store and transport the samples and necessary custody documentation. Further, the training must cover visual inspections protocols and documentation. This training shall be documented in the SWPP by name, and repeated periodically. While It would be good to hold this training in person it is recognized that on-line training be appropriate for smaller discharge sites.
WDOE should also identify how to qualify as a professional data collection entity that can be substituted for an on-site person.
A related discussion is the application of new technology to stormwater sampling. The NAS report discusses the possible application of web-based sampling devices, visual monitoring and advanced data collection / distribution. Suggest that this discussion is a perfect assignment for the Washington Stormwater Center of Excellence under contract from Ecology and supported by voluntary contribution from permittees and others. The use of modern technology may reduce the costs associated with sampling and inspections for many permittees. It may also allow a central entity to conduct the required monitorin from a remote location which would allow more experienced personnel to develop high quality data that supports ECM. This could be particularly useful in the development of a real event data base for vari SCM. A situation that would benefit all permittees who need a SCM for a particular situation or pollutant.

G: Ground water and Infiltration
EPA should consider incentives to encourage industrial stormwater infiltration or capture and use where appropriate. The most significant incentive would be assurance that installation of infiltration in accordance with EPA guidance for determining the appropriate design storm that provides relief from the corrective action process associated with episodic events.
Take-away: The new provisions in the ISGP seem to work against this recommendation by attempting to impose a new layer of risk to permittees who employ infiltration. A quick scan of the Stormwater Manuals clearly demonstrates that infiltration is, and has been, a strongly recommended approach to managing stormwater; particularly, in relation to flow control. The addition of a ground water contamina provision into the ISGP does not encourage the use of infiltration and thus creates an inadvertent incentive for SCM designers to increase flow to avoid infiltration that could potentially result in a vague requirement to test and prevent ground water contamination. During the Moses Lake and Lacey briefings the presenters explained that the WDOE stormwater section would not be the deciding authority on subject and that it would be referred to the hydro-geology section. The groundwater issue is not just with the ISWGP as it has equal application to MS4, DOT, construction, specialized ISWGP permits (i.e. wrecking) and individual permits of various kinds; thus, it would seem proper to pull the ground water provisions from the ISGP and create an entirely new ground water infiltration permit, under the hydro-geology group, that covers all the relevant users of these processes. That permit could include directions for those permittees, including those who use an Underground Injection Control system, as to standards that need to be meet under various ground water use scenarios such as " sole source aquifers", "drinking water ground water sources", "Non drinking water sources" and "ground water discharges adjacent waterbodies under a TMDL". The ISGP could reference this permit as one of the standard lists of additional requirements that are included by reference.
Related:
CONSIDERATION OF RETENTION STANDARDS IN THE MGSP. Stormwater retention for infiltration or beneficial use minimizes pollutant loads to receiving waters and reduces damaging peak flows while potentially increasing water availability. Yet, infiltration of industrial stormwater, which can contain hazardous pollutants in toxic amounts, can pose serious risks to groundwater; these risks must be managed to prevent groundwater contamination.
Take-away: The NAS acknowledges the risk of ground water contamination; however, it also brings up the important point of using retention as a means to protect the environment from excessive flows tha result in full or overfull bank flooding; the type of flooding that most strongly affects wildlife such as salmon spawning beds. The concept of including retention to all stormwater permits should be consider with the same, or greater, relevance as assigned to benchmarks. In this process WDOE will need to evaluate the retention needs not of just the one site but of the entire stream or watershed. Thus, the ISGP v join the MS4, Construction and other relevant flow affected permits to create a system wide control of flow/volume to protect the waterbody from adverse scouring resultant from stormwater discharges of a types. This component has been absent from the corrective action component of the permit and is addressed in the stormwater manuals only as percent flow reduction without reference to the discharge impa on receiving waters.

H: Adjustment to benchmarks and creation of WQBEL for toxic materials.
Advancements in the understanding of aquatic toxicology suggest that some benchmark threshold levels may require adjustment to reflect the latest scientific information. Additionally, the committee discus new benchmarks to better characterize stormwater risks, unnecessary benchmarks, and benchmark units used in documentation and communication.
The NAS report discusses a range of options and considerations for the revision and inclusion/removal of benchmarks as "indicators of the potential to pollute". Issues to be considered include bioavailabilit certain toxics & the use of biotic ligand model in copper. Additional benchmarks could include PCBs/ PAHs and similar substances due to their high toxicity or bio-accumulation. It is suggested that direct measurement may not be feasible so the use of COD/ others measure could be used as surrogates for these toxic/ bio-accumulative substances. The NAS report devotes an entire chapter (3) to this subject.
Take-away: The levels established for benchmarks are the result of a variety of inputs, many of which change as more information is developed. The inclusion of additional benchmarks for certain highly impacting chemicals may be justifiable for selected industries. A larger problem is the more ubiquitous chemicals that are either the result of heritage uses (i.e.: PCB's) or are air deposits across wide areas fi sources not related to the industries (i.e.: Mercury from coal fired facilities in SE Asia). While neither of these is the "fault" of the industry under permit it does create the question of is the industry responsil for removing these highly toxic substances. This is as much a legal issue as an ethics issue in none of us like to clean up someone else's mess; yet, if we don't do it who will? As these chemicals are often a watershed issue it should be considered as requirement for monitoring by MS4 permittee to determine their discharge impacts.
Additional consideration is needed in reviewing benchmarks in light of the NAS observation on sampling.
(when) all data reported are from composite samples, typically volume weighted. When compared to the early-storm grab sample of benchmark monitoring, the flow-weighted composite generally would b either equal or lower in concentration
Implementing those recommendations (multi flow weighted sampling over duration of events) will provide much more accurate data on the pollutant discharges (from variance of -125% for single grab to l teens for composited sampling). Thus, the results will be more accurate in sampling and the accuracy of the benchmark should be similarly accurate in predicting the "potential to pollute".

I: Tiered monitoring requirements
To improve stormwater data quality while balancing the burden of monitoring, EPA should expand its tiered approach to monitoring within the MSGP, based on facility risk, complexity, and past performar
The NAS report presents a policy discussion on how to address the monitoring requirements of industry based on several potential criterial. The objective is to minimize the impact on industry and agency resources while focusing on the discharges that have the potential to create harm to the receiving waters. This makes sense as there are already provisions for exempting no-exposure facilities and conversely there are additional requirements for select industries under the ELGs or WDOE judgement. The NAS report suggest consideration of the following tiers:
. Inspection only. Low-risk facilities could opt for permit-term inspection by a certified inspector or the permitting authority in lieu of monitoring.
. Industry-wide monitoring only. All facilities in sectors that do not merit additional pollutant monitoring would conduct industry-wide monitoring for pH, TSS, and COD.
.Benchmark monitoring. Sectors that merit additional pollutant monitoring, based on the most recent data and industry literature review

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.Enhanced monitoring. Facilities with repeated benchmark exceedances or those characterized by the permitting authority as large complex sites with high pollutant discharge potential
Take-away 1: This approach has substantial merit if the criteria used for categorizing the industries is protective of water quality and there is adequate oversite to ensure that industries in one category are monitored to identify those that need to be moved into a different category. Among the NAS recommendations is consideration of the site size (impervious surface), activities, on-site chemicals and local weather patterns. All reasonable considerations. I would suggest that a more basic consideration is needed- the ratio of discharge volume to the volume of the receiving water. An underlying fallacy in the benchmark systems is that it does not consider the impact of the discharge flow/volume on the receiving water in terms of ratio of volumes. Simply stated; if two identical industries with the same discharge volume characteristics and pollutants levels discharge to different streams the one that discharges to the smaller volume receiving waterbody with have a larger impact than the one discharging to the larger waterbody. Roughly stated in mathematical terms, if both dischargers release 100 cubic feet per second (cfs) the dischargers to a receiving water with 500 cfs will have about a 16% impact on the receiving bodies volume and pollutant levels. The second discharger releases its 100 cfs to a water body with 5,000 cfs with have a 1.6% impact on the waterbody; a difference of 14.4% in impact for the same discha The inverse is also true if the discharge volume between the two is widely different and the receiving water is the same for both (100 or 1,000 discharge to receiving of 1,000). [sorry for the math]
Take-away 2: Imbedded in the NAS recommendation is the use of certified inspectors or the permitting authority. This rotates back to a challenge of training and qualifications. Does Ecology have standards what would constitute as certified inspector. There are programs that provide certifications for a range of professions. The professional engineer is an example that is written into state law as a requirement f "signing off" on many engineering related projects- including some level 3 corrective actions. There is the Envirocert program that focuses on stormwater certifications at various levels including inspectors and industrial site management (full disclosure, I have two certifications from Envirocert). If WDOE chooses to go this route, then they need to specify the type of qualification that can be used by industry t certify an inspection only facility. I would also encourage WDOE, municipalities and others to encourage their employees to obtain these certifications as it will increase confidence of permittees and public the public employees have necessary knowledge. An alternative may be to have the Washington Stormwater Center of Excellence establish a statewide training program to certify professional inspectors wh are not qualified under an equivalent process.
Take-away 3: The requirements for a no-exposure facility are clearly defined in WDOE requirements. What is not defined is how these requirements are validated on a repetitive basis. While the initial application may receive the attention of a qualified inspector from Ecology, there appears to be no follow-on inspection requirement to ensure that the no-exposure conditions are maintained. Instead the no-exposure facility has a self-reporting requirement. Considering that most facilities have changes occurring over a five-year permitting period of structure, management or process it is conceivable that the initial inspection has been made moot. Suggest that WDOE amend its requirement for no-exposure to require an annual inspection by a certified professional with a report being submitted to WDOE verifyi not) the continued no-exposure exemption.

J: Compliance actions:
The ISWGP has a corrective action mechanism that was originally developed in the second permit in 2000 timeframe. It was a logical approach at the time with minimal understanding of the actual nature a content of stormwater and its impact on receiving waters. The underlying concept was that, since the benchmarks were not enforceable standards, they could be used to trigger reporting and action requirem that were enforceable. This has been an underlying problem with the data starved stormwater program nation-wide. The information provided in the NAS report provides pause if the current corrective actio system is either fair or effective in achieving the stated goals. Considering that the NAS has stated that the highly inaccurate grab sample approach (see C: above) should trigger corrective actions it would s logical that permittees under corrective action may have legal basis for challenging their designation based on the poor data quality. Also, WDOE lacks the flow data for both the discharger and receiving w and the receiving water quality at time of discharge. All of these factors combined lead to the conclusion that the use of grab sample benchmarks to justify corrective action has become indefensible.
The NAS report dwells on these issue in several places. One example is:
From the program's inception. It is widely recognized that the monitoring program suffers from a paucity of useful data and from inconsistent sampling techniques. Benchmark monitoring has been variously described as overly burdensome to industries and producing data that go unutilized. Some stakeholders question whether benchmark exceedances serve as useful indicators of the effectiveness of implement of stormwater control measures or potential water quality problems. If problems are observed, others express concern about a lack of enforcement mechanisms to ensure that the issues are effectively addressed.
Take-away: Bad or lack of relevant information creates an unreliable basis for issuing corrective actions. As data builds about the inaccuracy of benchmarks and lack of wet weather or other relevant water quality standards that are the foundation upon which the current corrective action system is based creates a system "on wet sand about to undergo a legal/technical earthquake"; which will destroy it. This concern is not new:
NRC (2009) concluded that "the stormwater program has suffered from poor accountability and uncertain effectiveness at improving the quality of the nation's waters."
The purpose of the stormwater program is to protect the nations waters. This can not be done with the current approach and the corrective action requirements in the proposed ISWGP will not further that go as no one knows if they are in anyway effective in obtaining the clean water goals. During questioning at Moses Lake briefing on the draft ISWGP Ecology was unable to provide any information on how m pollutant had been removed by corrective actions, which waterbodies had been improved to water quality standards by corrective actions, what flow mitigation had occurred due to retention requirements or most other basic data needed to evaluate the effectiveness of the program. The sole value relating to progress has been the grab sample data collected by permittees and that is now highly suspect due to variability. Summarized- we are doing corrective actions without any idea of what impact they are having and if that impact is even necessary to meet (wet) water quality standards. In old west terms we are "ready, shoot, aim, (and miss)" in the ISGP approach to corrective actions.

K: Corrective Actions:
The NAS report provides a relevant comment on the intent of stormwater program's use of data:
At a program level, MSGP monitoring data should also provide an indication over time whether the quality of industrial stormwater across the country is improving to meet the objectives of the MSGP (EP/ 2015a). Additionally, MSGP monitoring would, ideally, inform future decision making and updates to future general permits, such as refinements in benchmark thresholds over time based on the capabilitie treatment technology.
Take-away: The corrective action provisions should be significantly altered at the level 1 and level 2 condition to validate the level 3 actions being imposed. The following is provided as an example of the type of level 1 and level 2 corrective actions that should be triggered by benchmark exceedance.
Level 1: In addition to review of site source control measures and verification of functional SCM the permittee will be required to develop and implement a composite data collection approach for all its discharges that will operate through out at least one storm event each month. The permittee will be required to install and operate flow / volume monitoring processes that will provide automatic data on flo every 15 minutes to an automated data recording system during the composite sampling event. The permittee will be required to obtain the receiving water flow from the nearest waterbody flow measureme station (i.e.: USGS) for each hour of the event. There will be no exception for unmanned or after hour facilities. All data will be provided to WDOE in an acceptable electronic format. WDOE will be respor for reviewing the data and determining if an EMC based benchmark is being exceeded. [note: as mentioned previously WDOE may need to develop variations on this approach for tidal and still water situat If no exceedance, then the permittee will be allowed to return to standard sampling practices but will also be required to collect flow data over at least one storm event per month (preferably the one(s) that samples are taken. The entire sampling effort will be overseen by a qualified professional to ensure accurate data collection. WDOE will be required to evaluate the collected data to determine the ECM for exceedance of a benchmark. The permittee may evaluate the ECM to apply for benchmark exemption based on compliance with provisional Wet Weather water quality standards developed by WDOE. If th is continued benchmark exceedance, then:
Level 2: The permittee will be required to continue monitoring, source control and visual inspection requirements of level 1. The permittee will also engage a professional inspector to examine the site with special emphasis on structural controls that could be implemented to address discharge concerns. The report will be submitted to WDOE and included in the SWPP. The permittee will address all the inspec report findings and provide WDOE /SWPP an annual update on structural and source control improvements. The permittee will also conduct quantifiable testing of the SCMs on site to ensure they are work properly. The test results will be provided to Ecology and included in the SWPP. Non function SCM will be repaired or replaced as needed as part of structural controls. The monitoring data will be evaluate WDOE each year to identify if the level two actions are resulting in improvements that will bring the site within in benchmark standards (or numeric limits on 303d listed waterbodies). If yes, then the perm will revert to level one for one year and if conditions continue to be acceptable will revert to standard sampling and flow monitoring. The permittee may evaluate the ECM to apply for benchmark exemptio based on compliance with provisional wet weather water quality standards developed by WDOE. If progress is not acceptable; then,
Level 3: existing requirements for additional SCM, structural and source control measures will be required. Level 2 monitoring requirements will remain in force.

The objective of this revised corrective action program is to ensure that actions taken are necessary and have an actual measurable impact on the receiving waters. It will also provide WDOE with a source o data on the effectiveness of certain SCMs and may be used in future development of wet weather water quality standards. The permittee can be assured that they are not taking arbitrary actions based on unreliable grab sampling protocols. Thus, they have reason to trust that the funds being expended are actually making a difference in water quality. The NAS report has the following discussion on correctiv actions (applicable to MSGP) which have the same intent as the above example of corrective actions:
EPA develop requirements for "Additional Implementation Measures" (AIM) "substantially similar" to that detailed in Box 1-3. AIM would set specific actions that must be taken upon different levels of exceedance of the benchmarks or repeated exceedances. The specifics of the AIM tiers and the consequences of exceedances have not been finalized, but repeated exceedances of annual averages or large repeated exceedances could require additional structural stormwater control measures if feasible. If exceedances continue, an individual permit may be required. These requirements would provide stronger consequences to benchmark exceedances, thus increasing the significance of the benchmark thresholds.

L: Data availability to public:
While not specified in the NAS report the availability of all stormwater data to the public is essential in ensuring the trust in the process by the public. This data should be provided in easily used common formats (ie. Spreadsheets) so that they can be directly downloaded for use and analysis of the public. A simplified coding system could be used that allows public to access the data by permittee, NAIC, receiving water or water shed. WDOE has similar search capability for several programs (i.e.: water quality and TMDLs) so this should not be a significant cost to implement. With the input of new data, th public can evaluate the progress of stormwater program to remove quantifiable amounts of pollutant from discharges and determine the improvements to receiving waters. Businesses and inventors can utili the data to evaluate existing SCM and potentially develop new, more effective and/or less costly SCM. For those permittees who post their SWPP online the inclusion of links to those postings would be use (and not violate public records act?). Increasing understanding and involvement of the public will aid in supporting stormwater programs such as the Stormwater Center that are beneficial to agencies, busin and environmentalist alike.

I end this set of comments with the following from the NAS report:

NAS OVERARCHING MESSAGE
An overarching theme within the report's recommendations is that the MSGP should incorporate the best available science in the MSGP process. Science continues to improve our understanding of the environmental and human health impacts of industrial stormwater. Technologies for water quality monitoring, stormwater treatment, and modeling are advancing at rapid rates, and new data can inform understanding of the performance of stormwater control measures. New tools are being developed to improve toxicological assessments and data management and visualization. As electronic reporting of industrial stormwater monitoring data

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becomes fully implemented and integrated for all states, large amounts of valuable industrial stormwater data will be available for analysis, evaluation, and identifying areas for improvement. In general, EPA has been slow to adopt new knowledge into its MSGP permit revisions, but the MSGP should not be a static enterprise. Both permitted facilities and the nation's waters would be best served by a progressive and continuously improving MSGP based on analysis of new data and focused data-gathering efforts, advances in industrial stormwater science and technology, and structured learning to develop and evaluate permit improvements.

Sincerely,

Melvin W. Oleson
Certified Professional in Industrial Stormwater Management
Certified Professional in Stormwater Quality

Thank you for the opportunity to comment on the most recent version (in draft) of the Washington State General Stormwater permit for industrial dischargers. My comments below are based on substantial experience in the development and implementation of the current permit from the original ISWGP permit (1996) and additional work on the EPA's multisector General Permit for industrial dischargers. I currently hold a BS in Biology and have certifications from Envirocert Inc. as a Certified Professional in Industrial Stormwater Management (CPISM) and Certified Professional in Stormwater Quality (CPSWQ). I do not have any affiliation with any industrial, environmental, construction or municipal organization which allows me to make my comments based only on the merits of the permit to obtain the Federal Clean Water Act fishable, swimmable water bodies goals. The stormwater community is very fortunate to finally have a rigorous evaluation of the policy and technical challenges facing us all in the National Academy of Sciences study "Improving the EPA Multi-Sector General Permit for Industrial Stormwater discharges" (NAS). I am relying in significant extent for support of my comments on the findings from documentation provided by the National Academy of Sciences report (Pre Release version). Statements in the text of my comments taken from the NAS report are in **bold**. The report has many issues or relevance to the current effort to renew the ISWGP. I have selected a few of the many issues identified in the NAS report for detailed comment with the intent to demonstrate the need for a "time-out" in permit development and serious evaluation of the NAS reports conclusions and recommendations in formulating as successor ISWGP for Washington State. The EPA and Ecology (and other states) should coordinate their reissuance efforts through in-person and on-line discussions and recommendations. Washington permittees should provide coordinate input on any proposal to Ecology, through the formation of a stormwater advisory committee, potentially lead by the Washington Stormwater Center of Excellence, using the NAS report as a discussion baseline.

While it was my intent is to address the two phases that exist in every Industrial Stormwater General Permit developed since 1995. 1) Policy issues that surround the implementation and impact of the ISGP. 2) Practical science and engineering issues that, in many respects, shape the ISGP design I have found that the two elements are tightly interwoven. Thus, the following comments may have elements of both policy and technology. My thoughts may be identified by the term "*take-away*"

Summary: WDOE's permit evolution has stalled with the proposed reissuance of the draft permit as it is only a slight modification of the prior two permits. Ecology should extend the existing permit for 1-2 years during which time it evaluates, in conjunction with affected parties, the National Academy of Science report. The targets are to:
1) identify data collection needs to establish effective standards for stormwater pollutant and volume discharges. Include data collection requirements into the permit.

2) Anticipate EPA's 2020 permit development so that Washington State continues to have a leading role in the development of stormwater policy as well as compliance approaches and tools.
3) Consider various tiered approaches to permitting and compliance that minimize adverse impact on business while ensuring acceptable pollutant and volume discharges.
4) Utilize the Washington Stormwater Center of excellence to identify new technology approaches that will reduce the cost to permittees while increasing the quantity and accuracy of data collection.

Content guide:
WDOE Overarching Policy Criteria (preamble)
- Effective
- Efficient
- Enforceable

Effective Permit Recommendations and observations
A: Industry wide monitoring
B: Non-industrial monitoring
C: Event Mean Concentration (EMC)
D: First Flush
E: Wet weather standards/ mixing zones
F: Training
G: Ground water and Infiltration
H: Adjustment to benchmarks and creation of WQBEL for toxic materials
I: Tiered monitoring requirements
J: Compliance Actions
K: Tiered monitoring requirements
L: Data availability to public:
NAS OVERARCHING MESSAGE

Preamble:

When Congress amended the Clean Water Act to address the impact of non-process stormwater on the nations water quality it recognized that this was not the same as regulations for process water from industrial systems. Thus, certain "allowances" were made to allow the phased in approach to developing the EPA's Multi-Sector General permit and subsequent delegated State level permits. There was a recognition that the stormwater discharges had been largely unregulated and unmonitored. Thus, there was a minimal amount of data available to establish Effluent Limits or for that matter Water Quality Based Effluent limits. Thus, an alternative "indicator of potential to adversely impact water quality" was born- the benchmark" It was also recognized that since this new concept did not fit into any existing regulatory enforcement scheme, thus; it would not be an "enforceable limit" but rather would be used to trigger responses by permit holders. It was the compliance with the permit provisions for actions taken

in response to "exceeding a benchmark" that was the actual area of enforcement. Early permits policy strove to implement this new concept into the original permits. This was a logical policy action as the regulatory scheme goal for both WDOE and permittees was to develop an understandable process for identifying problem discharges and providing workable solutions to bring these discharges under a semblance of control. Due to the atypical nature of stormwater when compared to typical industrial discharges it was recognized that something different was needed to account for:

1) The unpredictable nature of rain events in both frequency and intensity.
2) The lack of any "stormwater water quality discharge standards" in recognition that application of existing environmental and human health standards was legally and technically unsupportable.
3) A paucity of procedures, processes and equipment to address stormwater quality.
4) Non-existent case law to address the myriad "grey" areas created by the new permits requirements' and impact on environment.
5) The existence of massive areas of impermeable ground (i.e.: pavement, roofs) that contributed to excess flows into receiving streams. The result of which were flooding and destruction of wildlife habitat and property.

That was all applicable then and resulted in early stormwater permits that used a variety of workarounds to allow transition by industry and WDOE into a more rational process. This culminated in a series of legislative bills and Pollution Control Board decisions that provided a framework for the next generation of industrial permits. Fortunately, WDOE took a constructive approach to enforcement with the intent of moving industry into compliance with the permits through education and technical support. The legislature also created the Washington State Stormwater Center of Excellence to, among other activities, identify functional processes and equipment that could be used by permittees to limit pollution discharges and support flow control.

There have been 24 years in the making of the factors that are to be addressed in the next generation of ISWGP. My analysis is that the permit that is proposed is a failure in the evolution of the permit process toward the goal of water quality
As stated in the NAS report: " **Although the 1995 MSGP was based on sound scientific and public policy principles, the committee found that many of the program elements have been hampered by shortfalls in generating, considering, and acting upon new information. This has resulted in missed opportunities for refining the MSGP monitoring requirements in support of improved stormwater management. In this report, the committee recommends updating MSGP benchmark monitoring requirements and thresholds using a periodic review process to incorporate the latest science and monitoring information into each permit revision**" .
Take-away: The Washington State permit continues to be constrained in its ability to address stormwater related water quality because this permit continues the interim policy of attempting to solely use "benchmarks" to assess the impact of the industrial discharges on the receiving

waters of the state. As noted in the NAS statement a periodic review to incorporate the latest science is needed- and this permit fails that goal.

A bit more background may clarify how the permit was intended to evolve into a tool that could actually and categorically determine what needed to be done to address the states stormwater quality issues.

The current permit was an interim step in an evolutionary plan to achieve three goals. These goals were agreed on with WDOE, Industry, and Environmental groups during legislative actions creating the stormwater RCW. The agreed aspects were that the permits would evolve to be:

1) **Effective**: This means that the permit would have the results of reducing pollution from industrial discharges to levels consistent with state water quality standards. Within this goal was the intent that methods would be developed that allowed the irregular discharge in both time and flow to be calculated so that the permittee was not placed in an impossible position of controlling the discharge to exacting standards as they would be for a continuous process flow. Rather, the cumulative impact of their discharge would be considered in context of the receiving waters ability to receive it. It would also consider the impact of flow rates on the receiving waters as a means to protect wildlife (especially salmon spawning grounds).

Take-away: Current Status: During questioning at the Moses Lake permit hearing and after researching the (nearly incomprehensible) WDOE web site it became obvious that WDOE does not have anywhere near sufficient information to determine what-if any- impact any particular discharge is having on any specific receiving water. Even taken at a regional or statewide level it appears there is insufficient useable information to determine mass loading discharges to receiving waters. In effect; there appears to be no understanding if the extensive work done to protect the states waters has achieved the goal or at least some portion of it. The NAS report makes clear that knowing the impact of Stormwater is a key goal:

"NAS: **The primary purpose of the MSGP monitoring program is to ensure that industries are complying with the terms of the permit and appropriately managing stormwater on site to minimize discharges of harmful stormwater pollutants to the local environment"**

In large part this is because WDOE permits have not been upgraded to collect additional information that is critical to understanding stormwater discharge- key among these is discharge flow/volume and receiving water flow/volume and pollutant load. For specific pollutants other factors also need to be collected.

2) **Efficient:** The intent here was that the permit would prescribe action by industrial users that were the least cost method of pollution and flow control consistent with obtaining the desired water quality standard. Embedded in this notion was that the permittee would have a selection of approved options from WDOE (The stormwater manuals) which were guidance but not regulatory requirements. These guidance documents could be used at any stage of the permittees efforts to comply and were presumed to be acceptable when used in corrective actions as dictated by the permittee when exceedances of benchmarks trigger a corrective action. The permittee could also use alternate processes and equipment if it the design and implementation meet WDOE approval.

Take-away: Current State: WDOE has done a commendable job of creating two manuals containing a bewildering array of options and recommendations for both pollutant and flow control. The Washington Stormwater Center of Excellence has been active in evaluating

additional stormwater control measures (SCM) for use. The problem that industry has is they really don't know which of the SCMs, if any, are needed to manage their stormwater to meet the desired water quality standards. This again goes back to the permit's failure to collect the needed data from the permittees (pollutant concentrations and discharge flows/volume) and the States failure to provide information on the receiving waters (flow/volume and pollutant loadings) *at the time the permittee discharges***.** Without this very basic information it is quite possible that many industries are spending excessive amounts to install SCM that are not needed while others may unwittingly be causing problems even though they are meeting the "synthetic" benchmark standards. Wasted time, money and depressed economic opportunity are all outcomes of failure to have the needed data sets to know what is happing to our receiving waters.

3) **Enforceable:** The original and subsequent permits were constructed such that it had a clear and precise set of "rules" that could be enforced against by WDOE when they were violated. Due to the use of synthetic standards (benchmarks) and the high levels of variability in site specific conditions it has proven difficult. WDOE has found that violations of either the reporting requirements or the compliance with the corrective action's provisions are the most tenantable enforcement actions. I was unable to find any direct water quality enforcement actions in WDOE's (very difficult to use) web site. The challenge of enforcement against synthetic standards (benchmarks) and focus on reporting/corrective action compliance may have had a role in WDOE enforcement program's focus on helping permittees come into compliance with permit provisions rather than with water quality standards- actually, WDOE has no way to enforce compliance as the ability to determine water quality non-compliance is impossible with the information available under terms of the permit.

Take-away: Current State: Unenforceable? How can that be? The answer lies in the basic underlying fallacy in the permit that compliance with benchmarks (a synthetic standard) is the same as compliance with water quality standards. The underlying cause of this problem is that permittees are not required to collect enough information to make a determination if they are complying with existing water quality standards. Also, there is insufficient technical information to develop effluent limits or wet weather water quality based effluent limits. As noted above, and repeated for emphasis, the information needed to make basic determination are:

1) discharge pollutant content
2) discharge flow rate/volume
3) receiving water pollutant loading
4) receiving water flow rate/volume
5) For selected pollutants other factors such as hardness, pH or salinity may impact the calculations.
6) Unique to stormwater is frequency of discharge as well as flow rates/volume.

The benchmark system only collects one of these factors "discharger "pollutant loading". Which has incomplete relevance to actual impact on the receiving waters as it can not be converted into

an actual impact on water quality standards without the additional listed information. This benchmark is supposed to be an indicator or the "potential" to cause a violation of a water quality standard, and in reality, without additional information, it fails in that role as noted by NAS. WDOE has well documented how this benchmark standard was developed and what factors they included. Yet, an "indicator of potential to violate water quality standards" is not in and of itself an enforceable value- as it doesn't much when applied to real world circumstances. As noted in the NAS report below the sampling method, normally a "single grab" injects such a high error rate as to make the data highly suspect in essential calculations.

As a policy issue the NAS comments:

Because of the paucity of rigorous industrial SCM performance data, the development of new numeric effluent limitations (NELs) is not recommended for any specific sector based on existing data, data gaps, and the likelihood of filling them. Any new NEL that is developed would require extensive new data collection

(and thus)

EPA should update and strengthen industrial stormwater monitoring, sampling, and analysis protocols and training to improve the quality of monitoring data.

Hence, WDOE's permits lack of the requirement to collect even the most basic flow/volume data results in a total inability to establish standards that define a water quality problem and how it should be addressed. It further complicates the compliance issue in that the permittee may be arbitrarily required to employ extensive and expensive corrective actions when none- or a lesser degree- may be needed.

Take-away 1: The above discussion outlines why the currently proposed ISGP is neither:

Effective: without the relevant and necessary data we actually have no idea if all the work and funds being expended are helping meet water quality standards. We hope it is; but as noted in a quip: Hope is NOT a best management practice (BMP).

Efficient: without knowing what level of pollutant removal is needed industry is forced to take actions based on an arbitrary set of rules under the permits compliance protocol. Which may or may not be what is needed to attain the actual desired standard. Thus, it is very possible that some industry permittees are wasting significant funds for no or minimal gain while others may be causing water quality problems but are not being required to take action as they meet the synthetic standards of a benchmark.

Enforceable: If there is one thing that gets people angry it is the enforcement of arbitrary (and complex) paperwork rules to the exclusion of enforcement on the actual problem areas – cleaning up our water bodied. WDOE needs to have much greater data set to determine what level of impact industry and specific dischargers are having on the receiving waters of the state.

Take-away 2: Considering the above it is seeming obvious that the current ISWGP and the proposed successor, which is essentially the same, should be extended for 1-2 years while a new

permit is developed that addresses the actual water quality problems potentially caused by the discharges from industrial permittee's facilities. A focus on the issues and concepts included in the National Academy of Science report is an excellent starting point. The short extension of the current permit will suffice while a new effective, efficient and enforceable permit is created in conjunction with the permittees, environmental groups, EPA and other relevant participants. As an adjunct to this new permit there will need to be a streamline mechanism for the use of variances for stormwater permittee who need extended periods of time to achieve compliance, particularly with human health standards as recently revised for pollutants such as PCBs, PAHs and Phthalates. We should also consider narrative standards where appropriate.

Some ideas on what would make an effective permit are as follows.

A: Industry wide monitoring

The NAS report states: **EPA should require industry-wide monitoring under the MSGP for pH, total suspended solids (TSS), and chemical oxygen demand (COD) as basic indicators of the effectiveness of stormwater control measures (SCMs) employed on site.**
Take-away: Mandatory monitoring of a specific set of discharge measures provides data is needed across the board – all permits in all states. This need for consistent data is the basis for 1) comparison of discharges to receiving waters and 2) effectiveness of stormwater control measures (SCM). The overall state of failure to have this data is apparent in the lack of such data for use in developing regulatory limits and evaluating SCM's. The precise selection of pollutants to monitor can be debated and may need to include bio accumulative or sediment related discharges such as PCB and PAH. The inclusion of mandatory reporting of an agreed upon set of pollutants it is an important step in creating a national and state program to have consistent comparable information on "indicators" of SCM effectiveness and permittee discharges.

B: Non-industrial monitoring

However; it may not be enough to collect data only on industrial discharges- as noted in the NAS study:
EPA should update the MSGP industrial-sector classifications so that requirements for monitoring extend to nonindustrial facilities with activities similar to those currently covered under the MSGP. It is recommended that coverage be expanded to non-industrial NAIC codes if they pose a similar threat to water quality
Take-away: Washington has included some of these "similar" facilities in the ISGP; what is missing is data collection from a broader range of sources that are normally considered components of the MS4, Construction and many individual permits. The broader data collection will help define what SCMs work in what applications. Providing permittees in all permits with better and, hopefully, less costly (more efficient) SCMs than the current hit or miss approach created by lack of good performance data under wide range of conditions. A comparable collection of pH, TSS and COD data from MS4 discharges along with flow/volume rates would assist in evaluating the impact both industrial and municipal discharges have on the receiving water. Better yet would be MS4 collection of specific pollutant data comparable to that required on the basic ISWGP. Collecting data from one class of permittee and ignoring the contribution

of others simply skews the results to point they may be unreliable in developing wet weather discharge standards.

C: Event mean concentration:
It is not enough to just collect additional consistent pollutant loading data. An effective data collection system will collect flow/volume data to support the development of Event Mean Concentration (EMC) for each discharger. The NAS report discusses this at length, but; a couple of lines from the report provide a basic understanding of the concern:
The difference between concentrations in first-flush runoff and later runoff can be an order of magnitude or more for some pollutants. This is not always the case, however, because changing rainfall intensity during a storm can provide energy mid-storm that may scour the drainage areas and produce high concentrations after the first flush.
Take-away: No one sample is likely to be accurate. A single grab sample has such a high variability in its likelihood of catching a representative sample of the pollutant load that it is in effect worthless (variance =125% per report).
NAS statement: **A grab sample will always be a snapshot of a rapidly changing situation. Trying to infer an EMC from a grab sample is not scientifically justifiable**
This failure of grab samples is driven by flow rates that are affected by factors such as drainage design, pipe diameter, slope, rainfall intensity variation, residuals from prior storms and other factors. To develop anything like a reasonable profile of the pollutant levels and mass of pollutants being discharged requires multiple sample collections over time. Equally important is the determination of flow/volume rates that can be converted into discharge volumes. The need for useful data is well summarized as:
Collection of composite volume-weighted samples over multiple storm events can provide a comprehensive understanding of annual pollutant discharge loads from a site and/or SCM performance over storms of different size. (note the volume-weighted component- i.e. flow).;
Take-away: WDOE needs to revamp it permit data collection requirement to address the development of sufficient information to support development of reasonable standards for permittees compliance. Key within these revamped measures are collection of ALL relevant data for making a determination of the impact of a discharge over a period of time on a receiving water. This in effect requires the collection of both pollutant levels and volume (flow) levels over an extended period of time. Further, WDOE needs to address ways that industrial dischargers to MS4s have an impact on the ultimate discharge to receiving waters. Concurrently, WDOE must develop a means to provide the permittee with receiving water information timely to their discharges so the impacts can be determined. The use of upstream USGS stations and development of Ecology pollutant measurement stations would be a step toward providing the necessary- time relevant information.

D: First flush
Within this discussion are several references to first flush collection requirements found in many industrial permits. The NAS evaluation is to the point:
The current MSGP requirement for grab samples during the first 30 minutes to capture the first flush is inconsistent with the methods used to derive benchmark thresholds. Technology based MSGP benchmark thresholds are derived from Nationwide Urban Runoff Program (NURP) values and secondary treatment requirements. NURP values are calculated from event mean concentrations (EMC) in stormwater discharges that were

characterized using composite sampling techniques (EPA, 1983).
Take-away: The current and proposed first flush of fall (September) collection requirement in the ISWGP is as meaningless as any other grab sample, as noted above. This specific requirement should be abandoned as ineffective and inefficient.

E: Wet weather standards/ mixing zones
A further consideration in the need for data collection is the issue of wet weather ELG and WQBEL. The typical ELG/WQBEL is developed on the premise of worst-case condition. That would include the lowest 10-year flow in the receiving water. The NAS report addresses this issue in two related discussions, mixing zones and wet weather standards.
Mixing zones: **A related issue is the development of wet weather Effluent Limit Guidelines and Water Quality Based Effluent Limits. By its very nature, industrial stormwater discharges occur during wet weather conditions when the receiving stream is expected to be flowing at some reasonable capacity above base flow, which could provide dilution of stormwater discharges. NPDES regulations allow for municipal and industrial process wastewater discharges to incorporate dilution and an impacted mixing zone when evaluating instream toxicity.**
AND
Wet Weather Standards: **The amount of pollution that a water body can assimilate and still support beneficial use goals is defined through adoption of water quality criteria. Most often, the criteria are pollutant specific and numeric and are designed around a low-flow dry weather condition, with the idea that this condition represents the highest pollutant concentration in a water body. However, stormwater flows will occur during quite different flow and loading conditions than those for which the criteria are typically established. Questions have been raised about the applicability and relevance of these criteria to wet weather conditions, but separate criteria for wet weather allowances have not been developed and implemented for industrial stormwater discharges.**
Take-away: WDOE needs to collect substantial data on pollutant discharge quantity/quality and the impact on the receiving waters in order to conduct the needed evaluation of the use of mixing zones and wet weather water quality criteria. The continued use of dry weather criteria creates an inherent excess of restrictive standards, especially for waterbodies covered by 303d designations or dry weather based TMDL waste load allocations. Since any discharger, including stormwater dischargers, must meet a water quality standard in a 303d listed waterbody-pending development of TMDL, the use of "dry weather" criteria in a stormwater context creates a burdensome demand on the permittee. As an interim measure it may be possible to create "narrative standards" of SCM to achieve these standards. These factors could be woven into the development of "synthetic Benchmark standard" for use by groups of dischargers with similar ratios of discharge volume to receiving waters thus providing a "indicator or reasonable potential to pollute" for the water quality pollutant. This could be expanded to a watershed-based benchmark that would more closely attune to the impact of dischargers. Current regulations place a significant burden on the use of mixing zones. This should be revisited with the intention of understanding how the higher flows during stormwater events may be addressed.
AND
There are special cases for developing ELGs and WQBEL or benchmarks. Tidal flows with and without inflowing streams and still waters (lakes, ponds, reservoirs). WDOE needs to develop alternative benchmark/limits for use in these situations. Tidal flows being highly dynamic and

bi-directional present a challenge to determine at what point the highest impact to receiving water occurs. Still waters have low dynamics, yet generally have substantial volume into which a discharge is released.

F: Training

Training as a source control measure.

The lack of mandatory training for personnel collecting stormwater data is tantamount to ripping out an essential source control measure (SCM). This evaluation is supported by the NAS discussion on the subject:

Data and field experience show substantial differences in the reliability of samples collected by facility personnel as compared to trained (watershed agency) personnel (K. Schiff, Southern California Coastal Water Research Project, personal communication, 2018). This difference is attributed to the fact that agency personnel are trained in water, wastewater, and stormwater sampling procedures and pollutant transport concepts and have experience with multiple stormwater situations. In contrast, industrial facility staff may not be trained in stormwater concepts or procedures. Inconsistent sampling at a given facility across multiple storms may result from using untrained personnel or by employing different personnel who implement procedures differently. The committee recommends training and guidance, including the possibility of a training/certificate program in stormwater collection and monitoring, to reduce the variation in sampling design and sample collection.

EPA should update and strengthen industrial stormwater monitoring, sampling, and analysis protocols and training to improve the quality of monitoring data.

Training is a problem on several fronts.

Take-away:1

1) Overarching concern is that inaccurate and inconsistent data makes it difficult to justify establishing relevant stormwater standards:

Because of the paucity of rigorous industrial SCM performance data, the development of new numeric effluent limitations (NELs) is not recommended for any specific sector based on existing data, data gaps, and the likelihood of filling them.

2) Inaccurate data may result in permittee expending significant funds to correct a problem that is more likely a sampling error OR a permittee may not be conducting corrective actions because of errors in the collected data.

3) SCM effectiveness is often determined by the measured ratio of pollutant discharged to that input. Inaccurate data will skew the SCM effectiveness or, worse, totally confuse if the SCM is at all effective.

EPA should update and strengthen industrial stormwater monitoring, sampling, and analysis protocols and training to improve the quality of monitoring data.

Take-away 2: Mandatory training for any person responsible for the sampling and flow measuring efforts must be incorporated into the permit. The training should cover the basics of sampling mechanics for grab and multi-grab or composite sampling. It should provide instructions on how to store and transport the samples and necessary custody documentation. Further, the training must cover visual inspections protocols and documentation. This training shall be documented in the SWPP by name, and repeated periodically. While It would be good to hold this training in person it is recognized that on-line training my be appropriate for smaller

discharge sites.
WDOE should also identify how to qualify as a professional data collection entity that can be substituted for an on-site person.
A related discussion is the application of new technology to stormwater sampling. The NAS report discusses the possible application of web-based sampling devices, visual monitoring and advanced data collection / distribution. Suggest that this discussion is a perfect assignment for the Washington Stormwater Center of Excellence under contract from Ecology and supported by voluntary contribution from permittees and others. The use of modern technology may reduce the costs associated with sampling and inspections for many permittees. It may also allow a central entity to conduct the required monitoring from a remote location which would allow more experienced personnel to develop high quality data that supports ECM. This could be particularly useful in the development of a real event data base for various SCM. A situation that would benefit all permittees who need a SCM for a particular situation or pollutant.

G: Ground water and Infiltration

EPA should consider incentives to encourage industrial stormwater infiltration or capture and use where appropriate. The most significant incentive would be assurance that installation of infiltration in accordance with EPA guidance for determining the appropriate design storm that provides relief from the corrective action process associated with episodic events.

Take-away: The new provisions in the ISGP seem to work against this recommendation by attempting to impose a new layer of risk to permittees who employ infiltration. A quick scan of the Stormwater Manuals clearly demonstrates that infiltration is, and has been, a strongly recommended approach to managing stormwater; particularly, in relation to flow control. The addition of a ground water contamination provision into the ISGP does not encourage the use of infiltration and thus creates an inadvertent incentive for SCM designers to increase flow to avoid infiltration that could potentially result in a vague requirement to test and prevent ground water contamination. During the Moses Lake and Lacey briefings the presenters explained that the WDOE stormwater section would not be the deciding authority on this subject and that it would be referred to the hydro-geology section. The groundwater issue is not just with the ISWGP as it has equal application to MS4, DOT, construction, specialized ISWGP permits (i.e. auto wrecking) and individual permits of various kinds; thus, it would seem proper to pull the ground water provisions from the ISGP and create an entirely new ground water infiltration permit, under the hydro-geology group, that covers all the relevant users of these processes. That permit could include directions for those permittees, including those who use an Underground Injection Control system, as to the standards that need to be meet under various ground water use scenarios such as " sole source aquifers", "drinking water ground water sources", "Non drinking water sources" and "ground water discharges to adjacent waterbodies under a TMDL". The ISGP could reference this permit as one of the standard lists of additional requirements that are included by reference.

Related:

CONSIDERATION OF RETENTION STANDARDS IN THE MGSP. Stormwater retention for infiltration or beneficial use minimizes pollutant loads to receiving waters and reduces damaging peak flows while potentially increasing water availability. Yet, infiltration of industrial stormwater, which can contain hazardous pollutants in toxic amounts, can pose serious risks to groundwater; these risks must be managed to prevent

groundwater contamination.
Take-away: The NAS acknowledges the risk of ground water contamination; however, it also brings up the important point of using retention as a means to protect the environment from excessive flows that result in full or overfull bank flooding; the type of flooding that most strongly affects wildlife such as salmon spawning beds. The concept of including retention to all stormwater permits should be considered with the same, or greater, relevance as assigned to benchmarks. In this process WDOE will need to evaluate the retention needs not of just the one site but of the entire stream or watershed. Thus, the ISGP would join the MS4, Construction and other relevant flow affected permits to create a system wide control of flow/volume to protect the waterbody from adverse scouring resultant from stormwater discharges of all types. This component has been absent from the corrective action component of the permit and is addressed in the stormwater manuals only as percent flow reduction without reference to the discharge impact on receiving waters.

H: Adjustment to benchmarks and creation of WQBEL for toxic materials.
Advancements in the understanding of aquatic toxicology suggest that some benchmark threshold levels may require adjustment to reflect the latest scientific information.
Additionally, the committee discusses new benchmarks to better characterize stormwater risks, unnecessary benchmarks, and benchmark units used in documentation and communication.
The NAS report discusses a range of options and considerations for the revision and inclusion/removal of benchmarks as "indicators of the potential to pollute". Issues to be considered include bioavailability of certain toxics & the use of biotic ligand model in copper. Additional benchmarks could include PCBs/ PAHs and similar substances due to their high toxicity or bio-accumulation. It is suggested that direct measurement may not be feasible so the use of COD/ others measure could be used as surrogates for these toxic/ bio-accumulative substances. The NAS report devotes an entire chapter (3) to this subject.
Take-away: The levels established for benchmarks are the result of a variety of inputs, many of which change as more information is developed. The inclusion of additional benchmarks for certain highly impacting chemicals may be justifiable for selected industries. A larger problem is the more ubiquitous chemicals that are either the result of heritage uses (i.e.: PCB's) or are air deposits across wide areas from sources not related to the industries (i.e.: Mercury from coal fired facilities in SE Asia). While neither of these is the "fault" of the industry under permit it does create the question of is the industry responsible for removing these highly toxic substances. This is as much a legal issue as an ethics issue in none of us like to clean up someone else's mess; yet, if we don't do it who will? As these chemicals are often a watershed issue it should be considered as requirement for monitoring by MS4 permittee to determine their discharge impacts.
Additional consideration is needed in reviewing benchmarks in light of the NAS observation on sampling.
(when **) all data reported are from composite samples, typically volume weighted. When compared to the early-storm grab sample of benchmark monitoring, the flow-weighted composite generally would be either equal or lower in concentration**
Implementing those recommendations (multi flow weighted sampling over duration of events) will provide much more accurate data on the pollutant discharges (from variance of +-125% for single grab to low teens for composited sampling). Thus, the results will be more accurate in

sampling and the accuracy of the benchmark should be similarly accurate in predicting the "potential to pollute".

I: Tiered monitoring requirements

To improve stormwater data quality while balancing the burden of monitoring, EPA should expand its tiered approach to monitoring within the MSGP, based on facility risk, complexity, and past performance.

The NAS report presents a policy discussion on how to address the monitoring requirements of industry based on several potential criterial. The objective is to minimize the impact on industry and agency resources while focusing on the discharges that have the potential to create harm to the receiving waters. This makes sense as there are already provisions for exempting no-exposure facilities and conversely there are additional requirements for select industries under the ELGs or WDOE judgement. The NAS report suggest consideration of the following tiers:

. **Inspection only. Low-risk facilities could opt for permit-term inspection by a certified inspector or the permitting authority in lieu of monitoring.**

. **Industry-wide monitoring only. All facilities in sectors that do not merit additional pollutant monitoring would conduct industry-wide monitoring for pH, TSS, and COD**.

.Benchmark monitoring. Sectors that merit additional pollutant monitoring, based on the most recent data and industry literature review

.Enhanced monitoring. Facilities with repeated benchmark exceedances or those characterized by the permitting authority as large complex sites with high pollutant discharge potential

Take-away 1: This approach has substantial merit if the criteria used for categorizing the industries is protective of water quality and there is adequate oversite to ensure that industries in one category are monitored to identify those that need to be moved into a different category. Among the NAS recommendations is consideration of the site size (impervious surface), activities, on-site chemicals and local weather patterns. All reasonable considerations. I would suggest that a more basic consideration is needed- the ratio of discharge volume to the volume of the receiving water. An underlying fallacy in the benchmark systems is that it does not consider the impact of the discharge flow/volume on the receiving water in terms of ratio of volumes. Simply stated; if two identical industries with the same discharge volume characteristics and pollutants levels discharge to different streams the one that discharges to the smaller volume receiving waterbody with have a larger impact than the one discharging to the larger waterbody. Roughly stated in mathematical terms, if both dischargers release 100 cubic feet per second (cfs) the dischargers to a receiving water with 500 cfs will have about a 16% impact on the receiving bodies volume and pollutant levels. The second discharger releases its 100 cfs to a water body with 5,000 cfs with have a 1.6% impact on the waterbody; a difference of 14.4% in impact for the same discharge. The inverse is also true if the discharge volume between the two is widely different and the receiving water is the same for both (100 or 1,000 discharge to receiving of 1,000). [sorry for the math]

Take-away 2: Imbedded in the NAS recommendation is the use of certified inspectors or the permitting authority. This rotates back to a challenge of training and qualifications. Does Ecology have standards for what would constitute as certified inspector. There are programs that provide certifications for a range of professions. The professional engineer is an example that is written into state law as a requirement for "signing off" on many engineering related projects- including some level 3 corrective actions. There is the Envirocert program that focuses on

stormwater certifications at various levels including inspectors and industrial site management (full disclosure, I have two certifications from Envirocert). If WDOE chooses to go this route, then they need to specify the type of qualification that can be used by industry to certify an inspection only facility. I would also encourage WDOE, municipalities and others to encourage their employees to obtain these certifications as it will increase confidence of permittees and public that the public employees have necessary knowledge. An alternative may be to have the Washington Stormwater Center of Excellence establish a statewide training program to certify professional inspectors who are not qualified under an equivalent process.
Take-away 3: The requirements for a no-exposure facility are clearly defined in WDOE requirements. What is not defined is how these requirements are validated on a repetitive basis. While the initial application may receive the attention of a qualified inspector from Ecology, there appears to be no follow-on inspection requirement to ensure that the no-exposure conditions are maintained. Instead the no-exposure facility has a self-reporting requirement. Considering that most facilities have changes occurring over a five-year permitting period of structure, management or process it is conceivable that the initial inspection has been made moot. Suggest that WDOE amend its requirement for no-exposure to require an annual inspection by a certified professional with a report being submitted to WDOE verifying (or not) the continued no-exposure exemption.

J: Compliance actions:
The ISWGP has a corrective action mechanism that was originally developed in the second permit in 2000 timeframe. It was a logical approach at the time with minimal understanding of the actual nature and content of stormwater and its impact on receiving waters. The underlying concept was that, since the benchmarks were not enforceable standards, they could be used to trigger reporting and action requirements that were enforceable. This has been an underlying problem with the data starved stormwater program nation-wide. The information provided in the NAS report provides pause if the current corrective action system is either fair or effective in achieving the stated goals. Considering that the NAS has stated that the highly inaccurate grab sample approach (see C: above) should trigger corrective actions it would seem logical that permittees under corrective action may have legal basis for challenging their designation based on the poor data quality. Also, WDOE lacks the flow data for both the discharger and receiving water and the receiving water quality at time of discharge. *All of these factors combined lead to the conclusion that the use of grab sample benchmarks to justify corrective action has become indefensible.*
The NAS report dwells on these issue in several places. One example is:
From the program's inception. It is widely recognized that the monitoring program suffers from a paucity of useful data and from inconsistent sampling techniques. Benchmark monitoring has been variously described as overly burdensome to industries and producing data that go unutilized. Some stakeholders question whether benchmark exceedances serve as useful indicators of the effectiveness of implementation of stormwater control measures or potential water quality problems. If problems are observed, others express concern about a lack of enforcement mechanisms to ensure that the issues are effectively addressed.
Take-away: Bad or lack of relevant information creates an unreliable basis for issuing corrective actions. As data builds about the inaccuracy of benchmarks and lack of wet weather or other relevant water quality standards that are the foundation upon which the current corrective action system is based creates a system "on wet sand about to undergo a legal/technical earthquake";

which will destroy it. This concern is not new:
NRC (2009) concluded that "the stormwater program has suffered from poor accountability and uncertain effectiveness at improving the quality of the nation's waters."
The purpose of the stormwater program is to protect the nations waters. This can not be done with the current approach and the corrective action requirements in the proposed ISWGP will not further that goal- as no one knows if they are in anyway effective in obtaining the clean water goals. During questioning at Moses Lake briefing on the draft ISWGP Ecology was unable to provide any information on how much pollutant had been removed by corrective actions, which waterbodies had been improved to water quality standards by corrective actions, what flow mitigation had occurred due to retention requirements or most other basic data needed to evaluate the effectiveness of the program. The sole value relating to progress has been the grab sample data collected by permittees and that is now highly suspect due to variability. Summarized- we are doing corrective actions without any idea of what impact they are having and if that impact is even necessary to meet (wet) water quality standards. In old west terms we are "ready, shoot, aim, (and miss)" in the ISGP approach to corrective actions.

K: Corrective Actions:
The NAS report provides a relevant comment on the intent of stormwater program's use of data:
At a program level, MSGP monitoring data should also provide an indication over time whether the quality of industrial stormwater across the country is improving to meet the objectives of the MSGP (EPA, 2015a). Additionally, MSGP monitoring would, ideally, inform future decision making and updates to future general permits, such as refinements in benchmark thresholds over time based on the capabilities of treatment technology.
Take-away: The corrective action provisions should be significantly altered at the level 1 and level 2 condition to validate the level 3 actions being imposed. The following is provided as an example of the type of level 1 and level 2 corrective actions that should be triggered by benchmark exceedance.
Level 1: In addition to review of site source control measures and verification of functional SCM the permittee will be required to develop and implement a composite data collection approach for all its discharges that will operate through out at least one storm event each month. The permittee will be required to install and operate flow / volume monitoring processes that will provide automatic data on flows every 15 minutes to an automated data recording system during the composite sampling event. The permittee will be required to obtain the receiving water flow from the nearest waterbody flow measurement station (i.e.: USGS) for each hour of the event. There will be no exception for unmanned or after hour facilities. All data will be provided to WDOE in an acceptable electronic format. WDOE will be responsible for reviewing the data and determining if an EMC based benchmark is being exceeded. [note: as mentioned previously WDOE may need to develop variations on this approach for tidal and still water situations] If no exceedance, then the permittee will be allowed to return to standard sampling practices but will also be required to collect flow data over at least one storm event per month (preferably the one(s) that samples are taken. The entire sampling effort will be overseen by a qualified professional to ensure accurate data collection. WDOE will be required to evaluate the collected data to determine the ECM for exceedance of a benchmark. The permittee may evaluate the ECM to apply for benchmark exemption based on compliance with provisional Wet Weather water quality standards developed by WDOE. *If there is continued benchmark exceedance, then:*

Level 2: The permittee will be required to continue monitoring, source control and visual inspection requirements of level 1. The permittee will also engage a professional inspector to examine the site with special emphasis on structural controls that could be implemented to address discharge concerns. The report will be submitted to WDOE and included in the SWPP. The permittee will address all the inspection report findings and provide WDOE /SWPP an annual update on structural and source control improvements. The permittee will also conduct quantifiable testing of the SCMs on site to ensure they are working properly. The test results will be provided to Ecology and included in the SWPP. Non function SCM will be repaired or replaced as needed as part of structural controls. The monitoring data will be evaluated by WDOE each year to identify if the level two actions are resulting in improvements that will bring the site within in benchmark standards (or numeric limits on 303d listed waterbodies). If yes, then the permittee will revert to level one for one year and if conditions continue to be acceptable will revert to standard sampling and flow monitoring. The permittee may evaluate the ECM to apply for benchmark exemption based on compliance with provisional wet weather water quality standards developed by WDOE. If progress is not acceptable; then,
Level 3: existing requirements for additional SCM, structural and source control measures will be required. Level 2 monitoring requirements will remain in force.

The objective of this revised corrective action program is to ensure that actions taken are necessary and have an actual measurable impact on the receiving waters. It will also provide WDOE with a source of data on the effectiveness of certain SCMs and may be used in future development of wet weather water quality standards. The permittee can be assured that they are not taking arbitrary actions based on unreliable grab sampling protocols. Thus, they have reason to trust that the funds being expended are actually making a difference in water quality. The NAS report has the following discussion on corrective actions (applicable to MSGP) which have the same intent as the above example of corrective actions:
EPA develop requirements for "Additional Implementation Measures" (AIM) "substantially similar" to that detailed in Box 1-3. AIM would set specific actions that must be taken upon different levels of exceedance of the benchmarks or repeated exceedances. The specifics of the AIM tiers and the consequences of exceedances have not been finalized, but repeated exceedances of annual averages or large repeated exceedances could require additional structural stormwater control measures if feasible. If exceedances continue, an individual permit may be required. These requirements would provide stronger consequences to benchmark exceedances, thus increasing the significance of the benchmark thresholds.

L: *Data availability to public*:
While not specified in the NAS report the availability of all stormwater data to the public is essential in ensuring the trust in the process by the public. This data should be provided in easily used common formats (ie. Spreadsheets) so that they can be directly downloaded for use and analysis of the public. A simplified coding system could be used that allows public to access the data by permittee, NAIC, receiving water or water shed. WDOE has similar search capability for several programs (i.e.: water quality and TMDLs) so this should not be a significant cost to implement. With the input of new data, the public can evaluate the progress of stormwater program to remove quantifiable amounts of pollutant from discharges and determine the improvements to receiving waters. Businesses and inventors can utilize the data to evaluate

existing SCM and potentially develop new, more effective and/or less costly SCM. For those permittees who post their SWPP online the inclusion of links to those postings would be useful (and not violate public records act?). Increasing understanding and involvement of the public will aid in supporting stormwater programs such as the Stormwater Center that are beneficial to agencies, business and environmentalist alike.

I end this set of comments with the following from the NAS report:

NAS OVERARCHING MESSAGE

An overarching theme within the report's recommendations is that the MSGP should incorporate the best available science in the MSGP process. Science continues to improve our understanding of the environmental and human health impacts of industrial stormwater. Technologies for water quality monitoring, stormwater treatment, and modeling are advancing at rapid rates, and new data can inform understanding of the performance of stormwater control measures. New tools are being developed to improve toxicological assessments and data management and visualization. As electronic reporting of industrial stormwater monitoring data becomes fully implemented and integrated for all states, large amounts of valuable industrial stormwater data will be available for analysis, evaluation, and identifying areas for improvement. In general, EPA has been slow to adopt new knowledge into its MSGP permit revisions, but the MSGP should not be a static enterprise. Both permitted facilities and the nation's waters would be best served by a progressive and continuously improving MSGP based on analysis of new data and focused data-gathering efforts, advances in industrial stormwater science and technology, and structured learning to develop and evaluate permit improvements.

Sincerely,

Melvin W. Oleson
Certified Professional in Industrial Stormwater Management
Certified Professional in Stormwater Quality