



319 Grant Funding: What, Why & How

Nonpoint Source Grants

March 12th, 2020



Nonpoint Source Pollution



- NPS pollution is the nation's and the state's number one threat to water quality.
 - There is no single point from which the pollution comes; it comes from everyone and everywhere.
- Stormwater runoff carries pollutants into waterways.
- NPS pollution in Illinois include runoff from farm fields, livestock facilities, construction sites, lawns and gardens, city streets and parking lots, surface coal mines, and forestry.
- The major sources of NPS pollution in Illinois are agriculture, urban runoff, and habitat modification.

AGGREGATE, NO

24" DIA, PVC SDR 35 PEI WITH 1" DIA, HOLES DRIL 0 1' O.C. AT 0, 90, 180

IEPA Section 319(h) – Nonpoint Source Pollution Control Financial Assistance Program

- Designed to provide grant funds for projects that prevent, eliminate, or reduce water quality impairments caused by nonpoint source pollution.
- Work with local government
- Projects that utilize cost-effective best management practices (BMPs) on a watershed scale.



Water Quality Projects Include

Wetlands (Rural and Urban)

- Wetland restoration or enhancement
- Wetland area protection
- New wetland development

Lakes (Rural and Urban)

- Lakeshore stabilization
- In-lake practices
- Detention practices (sediment and nutrient)
- Aeration\destratification

Agricultural

- Nutrient management
- Erosion and sediment control
- Livestock waste management (permitted activities not eligible)
- Livestock exclusion
- Buffers and filter strips

Urban

- Rain gardens and rain barrels
- Permeable and porous pavements
- Green roofs
- Bioswales

For more Urban BMP information, go to <u>Urban BMPs – Supplemental Guidance For Funding</u> <u>Eligibility</u>.

Resource Extraction (mine land abandoned mine land prior to 1972))

- Acid mine drainage control
- Soil erosion and sediment control

Riparian Zone (Rural and Urban)

- Native vegetation planting
- Tree and shrub planting
- Riparian wetland restoration

Education and Outreach Activities

Education and Outreach projects to promote awareness and implementation of activities that may help to restore degraded waters or protect waters from degradation due to NPS pollution. Projects could include statewide or community-based efforts such as training, displays, and workshops. Projects could also include the development of technical and administrative guidance tools to assist responsible units of government and agencies in the selection and implementation of BMPs and administrative mechanisms for controlling NPS pollution.

Monitoring for Environmental and\or Social Indicators

Environmental and social indicator monitoring to help document the need for NPS pollution control or to validate the accomplishments of ongoing and completed NPS pollution control projects.



Illinois Environmental Protection Agency Section 319(h) – Nonpoint Source Pollution Control Financial Assistance Program

Notice of Funding Opportunity Detailed Information

A. Program Description

Illinois Environmental Protection Agency (Illinois EPA) is seeking proposals for nonpoint source (NPS) pollution control projects (projects). The Illinois EPA receives federal funds through Section 319(h) of the Clean Water Act (<u>33 U.S.C 1329</u>) to help implement *Illinois' Nonpoint Source Management Program* (Illinois EPA, 2013). The requirements of the United States Environmental Protection Agency's (U.S. EPA) <u>Nonpoint Source Program and Grants Guidelines for States and Territories</u> apply to all recipients of grants made with funds appropriated by Congress under Section 319(h) of the Clean Water Act.

Illinois EPA's Section 319(h) Nonpoint Source Pollution Control Financial Assistance Program (a.k.a. Section 319(h) Grant Program) is designed to provide grant funds for <u>projects that prevent, eliminate</u>, <u>or reduce water quality impairments caused by nonpoint source pollution</u>. Performance measures for the program are outlined in Chapter 7 (Short- and Medium-Term Objectives and Milestones) of <u>Illinois'</u> Nonpoint Source Management Program (Illinois EPA, 2013).

Nonpoint source (NPS) pollution, unlike pollution from industrial and wastewater treatment plants, comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, and even underground sources of water. It has been determined that over 60% of the (national) documented water pollution problem can be traced to nonpoint sources.

NPS pollution control project types include:

- Implementation of an Illinois EPA approved Watershed-based plan;
- Implemenation of NPS components of an Illinois EPA approved Total Maximum Daily Load (TMDL);
- Development or update of a watershed-based plan;
- Development or update of a TMDL implementation plan;
- Best Management Practice (BMP) Implementation;
- Information and Outreach;
- Technical Assistance; and
- Monitoring.

Examples of best management practices (BMPs) and activities that have been funded through the Section 319(h) Grant Program are provided below. The list is not all-inclusive. See also the <u>Illinois'</u> <u>Nonpoint Source Management Program</u> (Illinois EPA, 2013) for a list of potential BMPs. Inclusion of a BMP, here or in the *Illinois'* Nonpoint Source Management Program does not equate to automatic eligibility for the Section 319(h) Grant Program.

Streams (Rural and Urban)

- Stream channel and streambank stabilization
- Meandering a channelized stream
- Levee removal or modification
- In-stream habitat restoration
- Reconnecting stream to floodplain

Illinois Environmental Protection Agency Section 319(h) Grant Program NOFO May 2019 - page 2 of 14

IEPA Section 319(h) Program

- Approximately 10 to 18 grants issued per year
- Approximately \$3.5 to \$4.5 million per year
 - Project range is \$80K \$2 million
- Reimbursement program
- 60/40 match (in-kind)
- Section 319(h) Grant Program applications are accepted by Illinois EPA by August 1st of each year



Notice of Funding Opportunity Summary Information

	Data Field	
1.	Awarding Agency Name:	Illinois Environmental Protection Agency (Illinois EPA)
2.	Agency Contact:	Scott Ristau
		epa.bowgrants@illinois.gov
		217-782-3362
3.	Announcement Type:	Initial announcement
		Modification of a previous announcement
4	Type of Assistance Instrument:	Grant
5.	Funding Opportunity Number:	2020 Section 319 NPS
6.	Funding Opportunity Title:	Section 319(h) – Nonpoint Source Pollution Control Financial
		Assistance Program
7	CSEA Number:	522.60.0278
1.	CSFA Number.	552-00-0578
8.	CSFA Popular Name:	Section 319(h) Grant Program
9.	CFDA Number(s):	66.460
10.	Anticipated Number of Awards:	Approximately 10 to 18 grant awards per year
11.	Estimated Total Program Funding:	Approximately \$3.5 to \$4.5 million per year
12.	Award Range	Not applicable. No set maximum or minimum amount.
13.	Source of Funding:	Federal or Federal pass-through
		State
		Private / other funding
14.	Cost Sharing or Matching	Yes 🗆 No
<u> </u>	Requirement:	
15.	Indirect Costs Allowed	■ Yes 🗆 No
	Postrictions on Indiract Costs	□ Yes • No
	Restrictions on Indirect Costs	If yes, provide the citation governing the restriction:
16.	Posted Date:	04/15/2019
17.	Application Range:	June 1, 2019 through 5:00 p.m. (CST) on August 1, 2019
18.	Technical Assistance Session:	Session Offered: Ves No
		Session Mandatory: very Yes No

Proposal Evaluation Criteria

Illinois Environmental Protection Agency

eau of Water • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

Section 319 Application – Project Details Section Instructions

Nonpoint Source Pollution Control Financial Assistance Program

Applications for Section 319 grant funds now require a Uniform Application for State Grant Assistance (UASGA) and Uniform Budget Template (UBT) in addition to the Section 319 Application – Project Details Section. Make sure the information is consistent between all 3 forms. The Item # for the UASGA is in () behind the item titles below.

1. Project Title (#43) This should reflect the project location/waterbody and nonpoint source (NPS) pollution control activity. 75 character max.

2. Project Applicant (Organization) (#16) Enter the name of the organization that is proposed to be the grant recipient. This is the organization that would enter into a contractual agreement with Illinois EPA if the project is selected for Section 319(h) Program grant funds. NOTE - There is space to identify additional project partners later in the application.

3. Identify the 8-digit Hydrologic Unit Code(s) where the project is located under the 'HUC #'. If the project is statewide – select 'Statewide'. If you do not know the HUCs where the project is located visit the Resource Management Mapping Service (RMMS) – the link is available in the footer of the application (<u>www.rmms.illinois.edu</u>).

4. Project Type Check <u>ALL</u> boxes that describe the type of activities to be completed by the project. If the project (or a component of the project) does not fit into the categories listed, check the "Other" box and describe the "Other" activities in the space provided at the bottom o the page.

e										
12 D	Digit HUC:	07120004	0402			AUID:	IL_GLA-0	5		
Pollutant load reductions										
BMP			No. of Units				Р	N	TSS	Sediment
			at Site	Unit Cost	Total cost	Design	Lbs/yr	Lbs/yr	Lbs/yr	Tons/yr
1	Streambank Stabilization (feet)		1,500	134.00	201,000	No	200	200	210	
2	Water and Sediment Control Basin (fe	et)	150	108.00	16,200	No	25	25	30	
3	Water and Sediment Control Basin (fe	et)	430	108.00	46,440	Yes	18	18	25	
4	Water and Sediment Control Basin (fe	et)	300	87.00	26,100	Yes	18	18	25	
					289,740		261	261	290	

14. Does this project include outreach, information and/or education activities?

🗌 Yes 📃 No

If "Yes", provide a summary of the activities to be implemented, why they are needed and the results expected. Attach additional pages to the end of the application as necessary to complete this narrative. If additional pages are used:

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- Include a note within the box that additional information is attached to the end of the document.
- Start the additional information with "Item 14. Outreach Activities"
- If "No", proceed to Item 16

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this

15. Summary of outreach, information and/or education products

Complete a row for each outreach, information, and/or education product to be developed. Add more lines as needed.

Products Audience		Number Produced	Total Cost	Comments
Web site	Adult- All	1	2,500	Interactive site focusing on watersheds & NPS
Brochure	Adult – Urban	2,500	1,500	Lawn care for urban homes
			4,000	

The proposed project must control, prevent or address NPS pollution.

- Quality of proposal
- Measurable results
 - Post levels are decreased
 - BMPs have prevented quantifiable pollutants from entering a system
- Cost Effective Solutions
 - \$20/SF vs \$50/SF of permeable pavement
 - \$1/LB vs \$100/LB of load reduction

Project Need

- 303d list
- Relationship to an approved watershed based plan



Watershed Based Plan

- A watershed-based plan is a comprehensive overview of the water quality conditions in a watershed.
- Identifies measures that need to be implemented to restore and protect water quality.
 - Assesses current conditions
 - Predicts future conditions
 - Makes recommendations to improve future conditions
 - Greatly assists with a successful Section 319(h) application for a proposed BMP in the watershed.

Ultimate goal: enable communities within the watershed boundaries to be eligible for 319 funding



Watershed Based Plan

- Nine Elements
 - Id of the causes and sources to be controlled to achieve load reductions
 - Estimate of the load reductions expected
 - A description of the NPS solutions with a amp of the critical areas
 - Estimate and identification of technical and financial assistance
 - Information / education
 - Schedule for implementation
 - Interim measurable milestones
 - Criteria used to determine if loading reductions are being achieved over time
 - Monitoring component to evaluate effectiveness



ONRCS



Copperas Creek Watershed Based Plan

June 1, 2018



Watershed Based Plan Development

On behalf of Metropolitan Planning Council and in conjunction with MWRD:

Cal Sag Channel (IL_H-01)(2017)Little Calumet River South (IL_HB-01)(2017)Poplar Creek (IL_DTG-03)(2018)Lower Des Plaines River (IL_G-03)(2018)



On behalf of the Rock Island Soil and water Conservation District (rural):

Copperas Creek (HUC 0708010105) (2018)



Watersheds (Urban)

Defined by IEPA using HUCs.



Watersheds (Rural)

Defined by IEPA using HUCs.



Plan Development – Watershed Inventory



- Alsip Drainage Ditch
- Oak Lawn Ditch
- Lucas Ditch and Cutoff
- Mill Creek
- Navajo Creek
- Melvina Ditch
- Stoney Creek (East and West)
- Tinley Creek







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Nonpoint Source

Plan Development – Watershed Inventory

Legend





Detention Basin and Lake Assessment

Riparian corridor Erosion Open Water or Dry **MWRD** Basins Field assessment

Nonpoint Source

Lake Oak Lawn

Existing Pollutant Loading using STEPL

- Per land use category
 - Nitrogen
 - Phosphorus
 - BOD
 - Total suspended solids
- Chloride as a function of application rate and lane miles
 - Municipality
 - Subwatershed
- Ranked based on 4 quartiles

B	0	D	E	-	0				K		
Ontional Dev		U	E	P	G	н	1	J	ĸ	L	M
5 Select au	a input:	drologie grou		A - bighest	infiltration on		wort infiltration				
Watershed	SHC A	SHC B	SHC C	SHC D	SHG	Soil N	Soil P conc %	Soil BOD	Soil E. coli		
watersneu	SIIGA	Sild D	Sild C	3110 0	Selected	conc %	Son P Conc. A	some %	Son E. Con		
					Selected	COIIC. 70		CONC.76	(#/100mg)		
W/1					B	0.080	0.031	0.160	0.000	1	
	_	_		<u> </u>		0.000	0.001	0.100	0.000	1	
6. Reference	runoff curve	number (ma	v be modifie	d)		6a. Detailed	urban reference run	off curve nun	nber (may be	modified)	
SHG	A	В	С	D		Urban\SHG	A	В	C	D	
Urban	83	89	92	93	1	Commercial	89	92	94	95	
Cropland	67	78	8 85	89		Industrial	81	88	91	93	
Pastureland	49	69	79	84		Institutional	81	88	91	93	
Forest	39	60	73	79		Transportation	98	98	98	98	
User Defined	50	í 70	80	85		Multi-Family	77	85	90	92	
						Single-Family	57	72	81	86	
						Urban-Cultivat	67	78	85	89	
7. Nutrient c	oncentration	in runoff (mg	/I) and E. col	i (MPN/100ml)		Vacant-Develo	77	85	90	92	
Land use	N	Р	BOD	E. coli		Open Space	49	69	79	84	
1. L-Croplan	1.9	0.3	3 4	0	1						
1a. w/ manur	8.1	2	12.3	0		7a. Nutrient	concentration in shal	llow groundv	vater (mg/l) a	nd E. coli (MP	N/100ml)(may b
2. M-Croplan	2.9	0.4	6.1	0		Landuse	N	Р	BOD	E. coli	
2a. w/ manur	12.2	3	18.5	0		Urban	1.5	0.063	0	0	
3. H-Croplan	4.4	0.5	j 9.2	0		Cropland	1.44	0.063	0	0	
3a. w/ manur	18.3	4	24.6	0		Pastureland	1.44	0.063	0	0	
4. Pasturela	0 1	0	0	0		Forest	0.11	0.009	0	0	
5. Forest	0.2	2 0.1	0.5	0		Feedlot	6	0.07	0	0	
6. User Defir	1 O	/ 0) 0	0		User-Defined	0	0	0	0	
8. Input or m	lodity urban	and use distr	la duataia L M	In a tituti a mal	Terret	R	Cincle Family W	Ushan	Magant	0	Tetel W
watersneu	Urban Area	Commercial	industrial %	msututional	Transportati	Fomily %	Single-Failing %	Cultivated	(developed)	Copen V	Aree
W/1	(ac.)	70	10	70	10	10	30	Cultivated	(developed)	Space %	100
		1 10		10		1 10			1 0		100
9. Input irrig	ation area (a	c) and irrigat	ion amount (i	n)							
			Water	Water							
			Depth (in)	Depth (in)							
	Total	Cropland:	per	per	Irrigation						
	Cropland	Acres	Irrigation -	Irrigation -	Frequency						
Watershed	(ac)	Irrigated	Before BMP	After BMP	(#/Year)						
W1	0	1 0) 0	0	0 0						
		concentration	n in runoff (m	g/I) and E. col	i (MPN/100m	1)					
10. Pasturel	and Nutrient		IDOD	F. coli							
10. Pasturela Land use	and Nutrient	Р	BOD		-						
10. Pasturel Land use 1. L-Pasture	and Nutrient	P 0.3	13	0							
10. Pasturel Land use 1. L-Pasture 1a. w/ manur	and Nutrient	P 0.3 0.3	13 13	0)						
10. Pasturela Land use 1. L-Pasture 1a. w/ manur 2. M-Pasture	and Nutrient	P 0.3 0.3 0.3	BOD 13 13 13 13	0							

Priority Areas



	Sub	N Load (li	b/ac)	P Load (II	b/ac)	BOD (lb/	Load 'ac)	Sed Load (t/ac)		Chlor Load (1	ide t/ac)	Riparian	Erosion	Rip Score	Sub	Priority Score
2015	STW1	7.8	4	1.42	4	27.2	3	0.56	4	0.27	4	POOR	MOD	3	STW1	22
10.1	LD	8.7	4	1.43	4	30.5	4	0.27	3	0.29	4	POOR	MOD	3	LD	22
and there a	ME	8.7	4	1.45	4	30.4	4	0.29	3	0.23	3	POOR	MOD	3	ME	21
10,000	CS5	8.4	4	1.38	4	29.2	4	0.20	2	0.32	4	POOR	LOW	3	CS5	21
in the l	OL	7.9	4	1.31	3	28.9	4	0.30	3	0.35	4	POOR	MOD	3	OL	21
and the second	T12	8.5	4	1.91	4	27.6	4	1.64	4	0.22	3	GOOD	LOW	1	TI2	20
10. 50	CSD	6.9	3	1.43	4	22.7	2	1.07	4	0.17	2	POOR	MOD	3	CSD	18
	CS4	7.8	4	1.231	3	27.6	4	0.18	1	0.15	2	POOR	LOW	3	CS4	17
1111	STE	7.3	3	1.212	3	26.3	3	0.25	2	0.22	3	POOR	MOD	3	STE	17
1	LDC	6.4	2	1.232	3	22.7	2	0.64	4	0.21	2	POOR	MOD	3	LDC	16
1000	MP	7.1	3	1.195	2	25.9	3	0.23	2	0.26	3	POOR	MOD	3	MP	16
	CSC	6.9	3	1.1	2	24.5	3	0.26	2	0.21	2	POOR	MOD	3	CSC	15
	STW2	7.4	3	1.215	3	27.2	3	0.17	1	0.29	4	NA	NA	0	STW2	14
	CS3	6.7	2	1.1	2	23.8	2	0.16	1	0.30	4	POOR	LOW	3	CS3	14
Carried Street	MI1	5.0	1	1.0	2	17.1	1	0.47	4	0.15	2	FAIR	MOD	2	MI1	12
	NV	6.6	2	1.159	2	23.4	2	0.36	3	0.22	3	NA	NA	0	NV	12
ALC: NO	CSA	3.8	1	0.7	1	13.3	1	0.26	2	0.07	1	POOR	MOD	3	CSA	9
CONC.	Т11	3.1	1	0.8	1	9.6	1	0.62	4	0.10	1	GOOD	LOW	1	TI1	9
	CS1	5.5	2	0.8	1	18.0	2	0.15	1	0.05	1	GOOD	LOW	1	CS1	8
	IMBC	5.1	1	0.9	1	15.2	1	0.30	3	0.03	1	NA	NA	0	IMBC	7
	CS2	0.7	1	0.2	1	2.4	1	0.02	1	0.05	1	FAIR	LOW	2	CS2	7
ſ	MI2	3.7	1	0.6	1	13.3	1	0.10	1	0.11	1	NA	NA	0	MI2	5

Overall Characterizations

- When compared to other watersheds in Northeastern IL with approved plans, nonpoint source loadings are on average greater in the Cal-Sag Planning Area for all constituents
- The Cal-Sag Planning Area is approximately 90%-95% developed excluding forest preserve areas
- Runoff from impervious area and land use change is a major cause for degraded water quality in the water bodies
- A strong correlation exists between impervious area cover and degradation of aquatic ecosystems in receiving waters
- BMPs are needed to address urban runoff and reduce stormwater volumes and pollutant loads





BMPs and Nonpoint Source Management Measures

- Detention basin retrofits
 - Introduction of forebays
 - Turf grass to native
 - Wetland bottom enhancement
 - Conversion to wet bottom
- Biorientation and vegetated swales
- Filter strips
- Permeable pavement
- Manufactured BMP structures
- Stream or channel restoration
- Riparian corridor/buffer restoration
- Floating wetlands
- Chloride reduction strategies



Dest management i racuce	Onit	Offic COst
<u>Bioretention</u> (Rain Gardens / Planter Boxes / Landscaped Medians) @ ~ \$4/ft ²	Ac	\$172,500
Bioretention as Green Roof (assuming structurally sound) @ ~ \$30/ft ²	Ac	\$1,307,000
<u>Dry Detention</u> as Blue Roof (assuming structurally sound) @ ~ \$20/ft ²	Ac	\$871,200
Extended Wet Detention (Detention Basin Retrofit - native planting in dry bottom pond)	Ac	\$12,500
Extended Wet Detention (Detention Basin Retrofit - wet bottom pond restoration and bank enhancement)	Ac	\$8,000
<u>Settling Basins</u> (To be included in all detention basin retrofits 4 ft deep) @ ~445 CY / AC @ \$30 / CY	Ac	\$13,500
Porous Pavement @ ~ \$8/ft ²	Ac	\$348,500
Vegetated Filter Strips @ ~ \$3/ft ²	Ac	\$131,000
Infiltration Trench @ ~ \$6/ft ²	Ac	\$261,500
Mechanical BMPs (assuming 1 per 10 acres of tributary area)	Ea	\$10,000
Weekly Street Sweeping	Ac	\$1,000
Water Quality Inlets (does not include maintenance)	Ea	\$350
Wetland Restoration	Ac	\$15,000
Streambank Stabilization	LF	\$130
BMPs not assessed using STEPL		
Streambank Enhancement – Replacement of hardscape with native	LF	\$100
Riparian Corridor Enhancement – Habitat Enhancement and Creation	Ac	\$9,000
Hydraulic Outfall Structure Retrofits with Forebay Retrofits	Ea	\$75,000
Floating Wetlands (quantified as unit(s) per acre of open water)	Ac	\$10,000

Plan Implementation – Synthetic BMP Scenario





- Various BMPs were selected for each subwatershed to generate the highest pollutant load removal and BMP efficiency per land use.
- Example Residential Land Use (BMP Scenario)
- Rain gardens or *bioretention* area at a rate of 0.06 acre/acre (50 feet x 50 feet per acre) of residential area.
- Detention pond retrofits:
 - Conversion of dry bottom ponds to a naturalized bottom for area of pond to create <u>extended wet detention</u>.
 - Addition of forebays or <u>settling basins</u> at a rate of 0.03 acre / acre of pond (25 feet x 50 feet per acre of pond) x 2.
 - Enhancement of wet bottom ponds for area of pond to create <u>extended</u> <u>wet detention</u>.
 - Addition of forebays or <u>settling basins</u> at a rate of 0.03 acre / acre of pond (25 feet x 50 feet per acre of pond) x 2.
 - Enhancement of wetland ponds to create <u>wetland detention</u> for the area of pond. Invasion species maintenance and management, increase biodiversity.

BMP Implementation (25%)



- BMPs were applied to land use categories.
 - Residential
 - Industrial/Commercial
 - Roadway ROW and Transportation Hubs
 - Various where opportunities exist
 - Streambank and Riparian Corridor Restoration
- BMP Calculator in the STEPL suite was used to determine overall BMP effects.



Load Reduction and Cost – 25% Implementation

Subwatershed	ВМР Туре	Amount	Unit	Cost	Load Reduction				Cost to Implement BMP @25%
	Bioretention (Rain Gardens / Planter Boxes / Landscaped Medians) @ ~ \$4/ft ²	12.0	Ac	\$172,500	~	ar)		r)	\$2,070,000
	Detention Basin Retrofit - native planting in dry bottom pond	0.2	Ac	\$8,000	(Ibs/year	d (Ibs/ye	ss/year)	tons/yea	\$1,920
	Settling Basins	0.02	Ac	\$13,500	eq	ICE	H (Ib	ed(\$203
LD (2,188 acres)	Porous Pavement @ ~ \$8/ft²	12.8	Ac	\$348,500	educe	Redu	Iucec	educ	\$4,443,375
	Weekly Street Sweeping	127.5	Ac	\$1,000	en Re	orus I	Red	nt Re	\$127,500
	Water Quality Inlets (does not include maintenance)	411.4	Ea	\$350	Nitroge	hosphc	BOD	Sedime	\$143,990
	Wetland Restoration	2.3	Ac	\$15,000		Ē		0)	\$34,613
	Streambank Stabilization	4476.5	LF	\$130					\$581,945
Subwatershed Total					498	82	1,074	57	\$7,403,545

BMP Implementation (25%)





Watershed-side BMP Implementation

- Watershed wide implementation in the **Cal-Sag Planning Area** results in a 17% reduction with an overall cost of \$227 million.
- Sediment load reduction is significant, suggesting a reduction in transport of phosphorus, heavy metals and hydrocarbons.
- As a sensitivity analysis, an analysis equivalent to the 25% implementation level was conducted using a 75% implementation level.
- The higher level of implementation across the subwatersheds is impracticable given the costs.

Implementation Pato	Nitrogen Reduction	Phosphorus Reduction	BOD Reduction	Sediment Reduction	Cost
Nate	(lbs/yr)	(lbs/yr)	(lbs/yr)	(tons/yr)	(\$ Million)
25%	4%	5%	2%	17%	\$227
75%	11%	15%	7%	49%	\$680

Milestone and Implementation Evaluation Example

Subwatershed	ВМР Туре	Target Amount	Unit	2-Year Goal	5-Year Goal	10-Year Goal	25-Year Goal	Sediment Reduction Achieved (tons/yr) by Year 25
	Bioretention (Rain Gardens / Planter Boxes / Landscaped Medians) @ ~ \$4/ft ²	12.0	Ac	0.48	1.92	4.8	12	
	Detention Basin Retrofit - native planting in dry bottom pond	0.2	Ac	0.008	0.032	0.08	0.2	
LD	Settling Basins	0.02	Ac	0.0008	0.0032	0.008	0.02	
(2,188 acres)	Porous Pavement @ ~ \$8/ft ²	12.8	Ac	0.512	2.048	5.12	12.8	
	Weekly Street Sweeping	127.5	Ac	5.1	20.4	51	127.5	
	Water Quality Inlets (does not include maintenance)	411.4	Ea	16.456	65.824	164.56	411.4	
	Wetland Restoration	2.3	Ac	0.092	0.368	0.92	2.3	
	Streambank Stabilization	4476.5	LF	179.06	716.24	1790.6	4476.5	
Subwatershed								57
Iotai								

MWRD currently maintains an extensive database of permits issued including BMP acreage

Questions?







