**#20190011 China Lake Watershed-Based Plan Development Project**

Kennebec County Soil and Water Conservation District (KCSWCD)

1. **Project Information**

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| Project Start Date | November 1, 2019 |
| Project Completion Date | December 31, 2021 |

1. **Waterbody and Watershed Information**
2. **Background**

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| Waterbody Name | China Lake (Midas #5448) | |
| Waterbody Size | 3,937 acres (6.2 sq. mi.) | |
| Watershed Area | 16,704 acres (26.1 sq. mi.)[[1]](#footnote-1) | |
| Watershed Location | China, Vassalboro, and Albion; Kennebec County | |
| Watershed-based Management Plan | Watershed Based Plan – China Lake, Maine (Dec 2008) | |
| Public Access to Waterbody | Three (3) public boat launches and two (2) beaches. | |
| Drinking Water Supply | 8,700 customers | |
| Is water quality listed as impaired? | Yes, on DEP 2016 303(d) list – Category 4-A |
| Listed cause(s) and/or impaired use? | Primary Contact (based on TP and SDT levels) |
| DEP TMDL report(s) for the waterbody. | Total Maximum Daily (Annual) Load, 2001 |

1. **Waterbody and Watershed Physical Characteristics**

China Lake is an impaired, Great Pond Class A (GPA) lake with two basins (east and west). The watershed includes the smaller drainages of Evans Pond, Hunter Brook, Muldoon Stream, Starkey Brook, Jones Brook and Ward Brook in addition to 19 smaller tributaries. The topography within the watershed is a mixture of rolling hills surrounding wetland and pond basins. There are several small islands within the lake, most notably Indian Island, Green Island, Bradley Island, and Moody Island, three of which have seasonal residential use. Predominant land uses include forest-land, agriculture and residential development, as well as some urban and commercial land uses. The watershed of the east basin is heavily developed, primarily with residential homes, and the shoreline is lined with camps and houses. The watershed of the west basin is mostly rural with some residential development, and the shoreline is undeveloped because Kennebec Water District (KWD) owns an undisturbed buffer zone of varying width around nearly the entire basin. There are just two developed shorefront lots within the Town of Vassalboro, with the remainder owned by the KWD. China Lake has a single outlet, Outlet Stream, located on the western shore of the west basin, flowing north through Vassalboro to Winslow where it enters the Sebasticook River. The Outlet Dam is owned by the Town of Vassalboro and operated by the KWD.

**Description of Waterbody Uses and Value**

China Lake is utilized heavily for recreation, including boating, fishing and swimming (except that swimming is prohibited in the west basin). There are three public boat launches. Access is also provided by the China Four Seasons Club, where there is access to a semi-private beach on the eastern shore of the lake. There is also a public beach situated near the Causeway Road launch, maintained by the China Baptist Church.

Historical fisheries data reveal that China Lake once sported a renowned landlocked salmon, togue, and brook trout population; however, as water quality degraded and anoxic conditions prevailed in the hypolimnion, these populations became extinct[[2]](#footnote-2). Today the main game fishery is largemouth and smallmouth bass. Maine Department of Inland Fisheries and Wildlife (MDIFW) also stocks brook trout and brown trout which are predominately a put and take fishery, although some hold over trout populations are observed. Other current fish species include: brown bullhead, white and yellow perch, chain pickerel, common shiner, golden shiner, redbelly dace, creek chub, white sucker, and varieties of stickleback.

China Lake is designated as wild brook trout habitat by MDIFW. The watershed contains over 88 miles of perennial and intermittent streams connecting dozens of small ponds and wetlands to the lake. The watershed contains inland wading bird and waterfowl habitat in addition to multiple deer wintering areas. The least bittern (*Ixobrychus exilis*), a Priority 1 Species of Greatest Conservation Need (SGCN), has been identified within the wetland complex surrounding the lake’s inlet on Hunter Brook. Historically, it has been documented at 32 sites across 12 counties in southern and central Maine. However, survey efforts between 1998 and 2009 revealed only nine individuals at a total of eight sites in the state. The Eastern ribbon snake (*Thamnophis sauritus*) is a Priority 2 SGCN and has also been identified within the same wetland described above. The great blue heron (*Andrea herodias*), a Priority 2 SGCN, has been identified in the eastern watershed within a wetland complex surrounding the main stem of Hunter Brook just east of Evans Pond. Three significant vernal pools have also been identified in the northern watershed. "Significant vernal pools" are a subset of vernal pools with particularly valuable habitat that is protected by Maine law under the Natural Resources Protection Act (NRPA).

China Lake is a priority water in the Kennebec River Resource Restoration Plan at Maine Dept. of Marine Resources (MDMR), with an annual production potential of nearly 1 million alewives. In 2014 a multi-agency effort that included the China Region Lakes Alliance was launched to restore access to China Lake for alewives and other native migratory fish. By 2021 this Alewife Restoration Initiative will remove obsolete dams and restore free passage at six dams on Outlet Steam. The MDMR since 2015 stocks China Lake with 25,000 alewives annually (sourced from Lockwood Dam in the Kennebec). These adults spawn and soon exit the lake, with the resulting juveniles exiting in the fall. A recent review of water quality monitoring data by DEP’s Barry Mower suggests no significant change in China Lake water quality in the short time since low-level stocking began.

China Lake has been the source of water for the KWD since 1905, supplying Waterville and the surrounding area with drinking water. In the 1980’s, the water quality in China Lake rapidly changed from good to poor with the onset of annual nuisance algal blooms. The lake is currently listed as a 303(d) waterbody and a total maximum daily load (TMDL) study was completed in 2001. Because of this, China Lake has been well studied and monitored the past 40 years.

1. **Water Quality Problem or Threat**
2. **Water Quality Overview**

Algal blooms have been reported yearly since 1983 and DEP currently describes China Lake as blooming annually with a “very high” risk for future blooms. Currently listed as an impaired lake, it appears in the 2016 Integrated Water Quality Report – 303(d) list of impaired waterbodies under Category 4-A. The water quality in China Lake has been monitored since 1970. Data indicate a rapid decline in water quality during the mid-1980s and still remains below standard.

The KWD is an active steward of the lake, and ongoing monitoring efforts have continued since the 2008 watershed-based plan. KWD continues to monitor China Lake bi-weekly for secchi disk transparency (SDT), dissolved oxygen (DO), temperature, total phosphorus (TP), and chlorophyll-a (Chl-a). KWD staff are certified water quality monitors through Lake Stewards of Maine. Monitoring is conducted from ice out (May) until the water is too shallow to put a boat in the water at the Vassalboro boat ramp (typically October/November). TP and Chl-a are monitored May-October/November in the west basin of the lake. The north and south basins are monitored in August and September. KWD participated in the Maine Drinking Water Program’s cyanotoxin study in 2017 and will be required to sample for cyanotoxins again in 2020 as part of the EPA’s Unregulated Contaminant Monitoring Rule. KWD staff conduct monitoring at the Outlet Dam, taking weekly TP samples since implementation of the revised drawdown method in 2014 when the timing of the lake drawdown was changed to coincide with fall destratification and increased the depth of the drawdown from 1.5 ft to 2.5 ft below the spillway. KWD has not yet quantified how effective the revised drawdown program has been, but this will be reviewed in this project.

Station #1 (west) - SDT has been recorded in the west basin of China Lake since 1971. Average SDT at station #1 is 3.7 m with a range of 1-10 m. Average TP from epilimnetic core samples collected between 1976 and 2016 is 19 ppb. Average TP from bottom grab samples is 32 ppb. Chl-a samples collected between 1976 and 2016 reveal an average Chl-a concentration of 12 ppb with a minimum concentration of 1.1 ppb and a maximum concentration of 68 ppb. Recent dissolved oxygen (DO) profiles from summer months in 2016 and 2017 show anoxia is occurring at depths greater than 8-10 m below the surface.

Stations #2 and #3 (north & south) - SDT has been recorded in the north and south basins of China Lake since 1970. Average SDT is 3.7-3.8 m with a range of 1-8 m. Average TP from epilimnetic core samples collected between 1980 and 2014 is 18-19 ppb. Average TP from bottom grab samples is 42-53 ppb. Chl-a samples collected between 1980 and 2014 reveal an average Chl-a concentration of 12-13 ppb with a minimum concentration of 0.7 ppb and a maximum concentration of 89 ppb. Recent DO profiles collected in the east basin at the deep hole in August and September of 2016 and 2017 reveal that summer anoxia is occurring at depths greater than 8-11 m below the surface.[[3]](#footnote-3)

1. **Watershed Nonpoint Pollution Sources and NPS Mitigation Activities**
2. **Summary of Past Watershed Assessments and Most Important Nonpoint Sources**

China Lake Total Maximum (Annual) Load (MEDEP, October 2001) – The China Lake TMDL set an in-lake TP summertime concentration target goal for China Lake of 15 ppb.

A Watershed Analysis of China Lake (Colby Environmental Assessment Team, Colby College, February 2006) – Investigated the water quality of China Lake from June-December 2005. Confirmed that the accumulation of phosphorus resulting from surface runoff, shoreline erosion, and internal nutrient loading negatively affects water quality of China Lake.

Watershed Based Plan for China Lake (KCSWCD, December 2008) - This plan outlined tactics to reduce the amount of phosphorus entering China Lake from 2008-2018. This ten-year watershed-based plan aimed to reduce 33% of the load reduction needed to restore water quality.

Feasibility Study and Alternatives Analysis for Internal Phosphorus Reduction in China Lake (Kleinschmidt, October 2012) – The KWD received a Source Water Protection Grant to determine if there is a feasible method to reduce internal phosphorus (P) recycling in China Lake. The study recommended changing the lake level in order to start the drawdown the first of October to an over winter lake level target. Starting the process of an alum treatment was also recommended.

Potential Effects of Alewife Restoration in China Lake (Kleinschmidt, August 2015) - This report provides a literature review, a regional analysis, a site-specific analysis, and conclusions regarding the probable effects relating to water quality of restoring alewife in China Lake.

China Lake Road and Culvert Survey (KCSWCD, 2016) – This survey documented conditions on 46 roads within the China Lake watershed focusing on roadways near the shoreline of the east basin of China Lake. Survey results indicate that nine roads need improvements, 14 roads are in fair condition, and 23 roads are in good condition. The culvert survey identified 25 failing culverts and documented conditions at all culverts within the focus area.

1. **Description of Watershed Activities to Address NPS Sources**

Watershed Implementation (319) Projects: The China Lake NPS Reduction Project, Phase I (#2003R-37) was implemented by CRLA March 2006 – March 2008. This project resulted in the design and installation of 23 BMPs, 91 property owner consults, and an estimated 61 tons of sediment prevented from reaching China Lake. The China Lake NPS Reduction Project, Phase II (#2007RT28) followed the completion of the Watershed-Based Plan and Phase I of implementation in 2008-2010. The overall TP reduction for this project amounted to 212 kg TP/year with conservation practices installed on priority working (Ag) lands and BMP implementation on 13 high impact NPS sites. These projects were funded in part by USEPA under section 319 of the Clean Water Act. There was investment of additional State, local and federal resources including Section 319 funds in previous years.

CRLA and China Lake Association (CLA): CRLA operates the Youth Conservation Corps (YCC) and Courtesy Boat Inspection (CBI) programs. The YCC’s implementation of erosion control methods and CBI’s efforts to keep invasive species out of the lake have proven to be low-cost, effective methods of protecting water quality. CRLA helped to fund the Culvert and Road Survey in 2016 and since has funded the replacement of several of the identified failing culverts. CRLA is working with KWD to receive funding to address the remaining high-impact sites in 2019. CLA established the China LakeSmart program in 2016 and since its inception has worked with the YCC program at 20+- sites per year; each site typically has multiple BMPs installed. The groups have worked collaboratively to secure grants, gifts and municipal funding to support these efforts.

Kennebec Water District: In addition to managing the annual China Lake monitoring program, the KWD has worked closely with the CLA and CRLA, contributing financially to the YCC and CBI Programs and the China LakeSmart Program. KWD has commissioned studies for the impact of the reintroduction of alewives on water quality and alternatives for removing internal phosphorus from the lake (2012 and 2015). In 2009 KWD took over the operation of the China Lake Outlet Dam. KWD was involved in efforts to implement an LID ordinance in the Town of China in 2013 as well as the survey of the gravel roads and culverts in 2016. In 2019, KWD applied for a Source Water Protection Grant to implement additional gravel road improvements on the highest priority sites identified in that survey, and has commissioned a Forest Management Plan that will focus on the management of KWD lands surrounding the west basin.

KCSWCD: The District has sponsored past watershed planning and implementation projects, coordinated the China Lake YCC and assisted the China LakeSmart program. KCSWCD conducted the 2016 Culvert and Road Survey and since 2009, KCSWCD staff have written 10 Road Management Plans for individuals and road associations within the watershed.

NRCS: NRCS has competed a total of 337 conservation practices across multiple agricultural and forest management sites within the watershed since 2008. This work was completed through the NRCS EQIP funding, Conservation Stewardship Program, and general NRCS conservation technical assistance services; 276 of the implemented conservation practices directly address either erosion or nutrient use.

Town of China: The Town of China has a long history of investment in China Lake. The Town has consistently provided financial support to the CRLA since its founding in 1995. In recent years, additional funding investments have been made through the China Tax Increment Financing (TIF) program: $20,000 in support of the Alewife Restoration Initiative (2016), $45,000 for China LakeSmart and YCC (2018-19), and $25,000 (2019) for road projects identified in the 2016 Survey. The Town explored development of a LID Ordinance in 2013 and while no ordinance has been adopted, LID standards have been incorporated into reviews for commercial developments along the Rt. 3 corridor and for residential subdivisions. A Shoreland Septic System compliance program was adopted in 2011 but was narrowly repealed the following year. In developing that program the Town worked diligently to create a septic system database based on local and state records and landowner surveys.

Despite these efforts, long-term water quality trends in China Lake continue to show declining water quality and the lake continues to experience persistent annual nuisance algal blooms. It is possible that the threat to water quality caused by rapid development in the watershed has been partially offset by the gains that have been achieved through past 319 implementation projects, NRCS programs, and ongoing YCC and LakeSmart projects. However, it is increasingly apparent that more work is needed, and that internal loading is still occurring as a result of historical phosphorus loading and seasonal anoxic conditions documented in the deepest areas of the lake. The combination of excess phosphorus in the bottom sediments, thermal stratification, anoxia, and the mixing of the water column results in a release of phosphorus from the sediments (internal loading) which fuels algal growth and can lead to persistent, recurring nuisance algal blooms such as those documented in China Lake.

A great deal has changed in the watershed since the 2008 Watershed Plan was completed, and a lot of good work has been done to address the external load. The 2008 plan focused heavily on addressing sources of phosphorus in the watershed based primarily on statistics and watershed conditions provided in the 2001 TMDL and the 2006 Colby College study – reports that are now outdated. It is critical that watershed stakeholders evaluate the effectiveness of past efforts and revise their current management strategies to effectively address water quality concerns. Reassessment of watershed NPS sources, a comprehensive analysis of in-lake conditions and loading, and a thorough study of historical water quality data and trends is now needed to determine the appropriate strategies moving forward. The plan will provide specific and current recommendations for addressing both the external and internal TP load, and establish a robust framework prepared by key stakeholders working together across municipal, political, and social boundaries toward the common goal of restoring China Lake.

1. **Purpose:**

The purpose of the China Lake Watershed-Based Management Plan Project is to create a comprehensive WBMP for China Lake with well-developed implementation strategies that effectively improve the water quality over the next 10 years. The process of plan development will result in the establishment of new, scientifically-sound water quality thresholds for designing an alternative water quality restoration strategy (in-lake treatment) and for addressing current sources of NPS pollution in the watershed. Major project accomplishments and outputs will include: a water quality analysis and diagnostic feasibility analysis for addressing anoxia; P loading estimates for high impact/priority NPS sites; a future monitoring plan; an updated watershed and pollutant load analysis and updated land-cover data layer; three technical review committee meetings, three stakeholder review committee meetings, and two public meetings.

1. **Partner Coordination, Roles and Responsibilities**

**Maine Department of Environmental Protection** will administer project funding, serve as the project advisor and provide project and technical support.

The **US Environmental Protection Agency** will provide project funding and work plan guidance.

**Kennebec County Soil & Water Conservation District** will: serve as a grantee for the project, serve on the steering committee, provide technical assistance for watershed surveys, and provide pollutant reduction estimates for high-priority NPS sites.

The **Kennebec Water District** will serve on the steering committee and provide funding for additional water quality analysis to support and inform the watershed plan and loading models and other tasks by providing $10,000 of cash match to this project.

The **China Region Lakes Alliance** will participate on the steering committee, create a project website, assist with the watershed survey tasks, and provide cash match in the amount of $5,000. It is anticipated that the CRLA will be the entity leading plan implementation.

The **China Lake Association** will serve on the project steering committee, advertise the project activities to its members, assist with the water quality monitoring and watershed survey tasks, and provide $2,500 in cash match.

The **Town of China** will participate on the steering committee, advertise project activities on its website/bulletin boards, provide needed administrative support, provide $10,000 in cash match.

A **qualified consultant** will be hired (following procurement procedures in the DEP’s NPS Grant Administrative Guidelines) to manage the technical tasks of this project and to assist with developing the China Lake Watershed-Based Management Plan.

1. **Tasks, Schedules and Estimated Costs**

All press releases, outreach materials, project signs, and plans will acknowledge that the project is funded in part by the United States Environmental Protection Agency under Section 604(b) of the Clean Water Act. Project staff will consult with DEP on EPA’s public awareness terms and conditions for Section 319 grants before the project commences. In addition, project staff will consult with DEP and EPA before project signs are designed. Refer to the Grant Agreement, Rider A. Section III. F. Acknowledgement.

**Task 1 – Project Management**

KCSWCD will administer the project according to the grant agreement with DEP and develop an RFQ for consulting services. This task includes tracking project progress, expenses, and matching funds, and submitting reports (semi-annual progress report, annual pollutants-controlled report, a final project report) and other deliverables.

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| Start and Completion Dates | January 2020 – December 2021 | |
| Grant Cost: $5,750 | Match Cost: $0 | **Total Cost: $5,750** |
| Breakdown of Grant by Cost Category: Salary & Fringe: $500; Contractual: $5,250 | | |
| Breakdown of Match by Cost Category: | | |

**Task 2 – Water Quality Analysis**

Water Quality Analysis **–** Historical data (secondary data) for China Lake will be combined with new water quality data collected by KWD under Task 3. Data will be analyzed to determine water quality trends, and any statistically significant changes in water quality over the historical time period and within the past 10 years. A water quality memo will summarize the water quality data and findings, identify any additional data needs and provide future monitoring recommendations. The technical review committee will assist with the evaluation of secondary data to determine if the data is acceptable to use for this project. The qualified consultant, with assistance from KWD, will prepare a brief Secondary Data Quality Assurance Guide with selection criteria appropriate for the project that will ensure that secondary data adequately support project conclusions, decisions and/or actions. Project staff will document the following secondary data evaluations in a table: data type; data source (originating organization, report title, date); how data will be used for the project; and limitations on data use, if any.

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| Start and Completion Dates | January 2020 – June 2020 | |
| Grant Cost: $3,800 | Match Cost: $970 | **Total Cost: $4,770** |
| Breakdown of Grant by Cost Category: Salary & Fringe: $100; Contractual: $3,700 | | |
| Breakdown of Match by Cost Category: Donated Services-Labor: $970 | | |

**Task 3 – Water Quality Monitoring and In-Lake Assessment**

Following the results of the water quality data analysis in Task 2, the technical review committee will determine additional sampling or in-lake assessment needed to better inform the watershed loading model and the internal recycling analysis (Task 4). The project consultant will develop and submit a Sampling and Analysis Plan (SAP) for the monitoring following ME DEP’s Lake Assessment Quality Assurance Program Plan (QAPP). Analyses or assessments that may be recommended include benthic sediment analysis, plankton analysis, TP profile sampling, muck mapping, tributary monitoring, or groundwater sampling. KWD has committed $5,500 in cash match to help fund additional sampling and/or assessment under this task. A summary of monitoring and assessment work will be produced by KWD or the project consultant.

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| Start and Completion Dates | April 2020 – October 2021 | |
| Grant Cost: $525 | Match Cost: $7,860 | **Total Cost: $8,385** |
| Breakdown of Grant Cost by Cost Category: Contractual: $525 | | |
| Breakdown of Match by Cost Category: Donated Services-Labor: $860; Contractual: $1,500; Other: $5,500 (toward additional monitoring and/or lab costs) | | |

**Task 4 – Watershed Modeling & Internal Recycling Analysis**

The trend of increasing dissolved oxygen loss and internal phosphorus recycling has been identified as a major water quality concern in China Lake. Additional monitoring under Task 3 of this project will provide the information needed to quantify internal loading and make specific recommendations for alternative restoration strategies. Maine DEP, KWD, CRLA and project consultants will work together in the development of these revised internal recycling estimates.

Watershed modeling will include a detailed land cover update in GIS, delineating the subwatersheds of major tributaries in the watershed, watershed loading modeling using an appropriate in-lake response model such as the Lake Loading Response Model (LLRM), and conducting field estimates of phosphorus and sediment loading from high impact/priority sites identified in the recent watershed reconnaissance efforts. The model will utilize the updated land cover data, the water quality analysis from Task 2, the internal recycling analysis, and pollutant loading reduction estimates from past 319 efforts. Modeling results will be presented to the technical review committee, calibrated, and revised to update the lake’s assimilative capacity analysis and used to set revised water quality goals and thresholds for the plan.

With additional water quality data collection and analysis in 2020 and 2021, the project team will quantify internal loading and make specific recommendations for treatment options and alternatives. The team will work together in the development of revised internal recycling estimates and will develop an internal recycling and alternative restoration feasibility analysis report, updated GIS land-cover layer, watershed modeling memo and model spreadsheet, and NPS phosphorus loading estimate spreadsheet.

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| Start and Completion Dates | March 2020 – October 2021 | |
| Grant Cost: $3,500 | Match Cost: $5,301 | **Total Cost: $8,801** |
| Breakdown of Grant Cost by Cost Category: Salary & Fringe: $400; Contractual: $3,100 | | |
| Breakdown of Match by Cost Category: Donated Services-Labor: $1,601; Cash: $Contractual: $3,700 | | |

**Task 5 – Watershed Survey, Ag/Forestry Survey, & Septic Vulnerability Analysis**

1. Watershed Survey - KCSWCD and DEP will organize and facilitate a watershed survey using methods outlined in *A Citizen’s Guide to Volunteer Lake Watershed Surveys* (DEP, 2011). The KCSWCD will prepare a Survey Implementation Plan (SIP), to be approved by DEP prior to commencing survey efforts, which will guide survey implementation for quality assurance. The KCSWCD will recruit local volunteers, conduct a volunteer survey training session and enter all survey data into Site-Tracker, or similar Excel spreadsheet. DEP will take the lead in delineating survey sectors. All properties with LakeSmart awards will be excluded from the survey, and all properties that were evaluated through LakeSmart, but did not pass for reasons not related to NPS pollution, can also be excluded only if documentation is available. The watershed survey will focus on shorefront properties. Any roads previously assessed will not be formally evaluated during the survey, however any roads issues observed will be noted and checked against the existing KCSWCD road survey. Roads that have not been previously assessed by KCSWCD and all watershed stream crossings will be included in the 2020 watershed survey.
2. Ag and Forestry Survey - KCSWCD will assess agricultural lands and active forestry operations throughout the watershed and provide a summary memo of survey results. While the total area of agricultural land in the watershed is small, 30% of the total P load was estimated to come from this source (MEDEP, 2001). KCSWCD will utilize the updated land cover layer and work closely with NRCS to complete this task.
3. Septic Database and Vulnerability Analysis - The Septic System Database previously created by the Town of China will be reviewed and updated as needed, and a Septic System Vulnerability Analysis and Report will be completed by the project consultant. This report will also include a GIS analysis showing parcels where there is increased likelihood of septic issues due to soil type (i.e., sandy or shallow to bedrock), proximity to the lake, age of system and other considerations.

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| Start and Completion Dates | January 2020 – December 2020 | |
| Grant Cost: $6,200 | Match Cost: $7,596 | **Total Cost: $13,796** |
| Breakdown of Grant Cost by Cost Category: Salary & Fringe: $4,350; Contractual: $1,575; Travel: $125; Supplies: $150 | | |
| Breakdown of Match by Cost Category: Donated Services: $1,521; Contractual: $2,775; Salary: $1,650; Other: $1,650 (for additional technical leaders) | | |

**Task 6 – Stakeholder, Steering & Technical Advisory Committee (TAC) Meetings**

1. Stakeholder & Steering Committee Meetings – The China Lake WBP Steering Committee will include representatives from KCSWCD, KWD, CRLA, CLA, Town of China, DEP, NRCS and project consultants. The Steering Committee will meet three times to help guide the development of the WBMP and will convene two stakeholder meetings, which will be open to the public, to garner input and support for the project and to also help guide the development of the WBMP. Project information will be posted on lake/watershed association, Town of China, and KWD web sites, and two press releases will be written and distributed to local news outlets: Kennebec Journal, Morning Sentinel and Town Line.
2. Water Quality Technical Review Committee Meetings – This committee will include representatives from KCSWCD, KWD, CRLA, DEP, and project consultants and will meet three times over the course of the project to review the key plan components, including the water quality analysis summary, internal loading/alternative restoration analysis, modeling results and load analysis, and action plan with an emphasis on developing current and achievable restoration strategies.

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| Start and Completion Dates | January 2020 – October 2021 | |
| Grant Cost: $7,015 | Match Cost: $6,254 | **Total Cost: $13,270** |
| Breakdown of Grant Cost by Cost Category: Salary & Fringe: $300; Contractual: $6,175; Travel: $334; Supplies: $206 | | |
| Breakdown of Match by Cost Category: Donated Services: $4,255; Other: $2,000 | | |

**Task 7 – Develop Watershed-Based Plan**

The China Lake WBP will be completed using information developed in Tasks 2–5 (above). The plan will contain EPA’s required 9-elements including a detailed, stakeholder-driven 10-year action plan to improve water quality in China Lake, and multiple high-quality watershed maps showing the location of important natural resources, monitoring stations, NPS sites and more. A draft plan will be reviewed by both the steering committee and technical review committee and sent to the DEP and EPA for review 2-4 months before project completion. The final plan will be reviewed and approved by Maine DEP and US EPA. Any comments on the final plan must be addressed for the plan to be accepted.

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| Start and Completion Dates | January 2020 – December 2021 | |
| Grant Cost: $800 | Match Cost: $10,593 | **Total Cost: $11,393** |
| Breakdown of Grant Cost by Cost Category: Salary & Fringe: $100; Contractual: $700 | | |
| Breakdown of Match by Cost Category: Donated Services: $1,869; Contractual: $6,225; Other: $2,500 (printing WBMP) | | |

1. **Deliverables**

An electronic copy of each deliverable will be provided to the DEP Agreement Administrator. DEP will forward an electronic copy of all deliverables to EPA. Each deliverable will be labeled according to procedures described in DEP document *Nonpoint Source Grant Administrative Guidelines*, [*http://www.maine.gov/dep/water/grants/319-documents/2016GrantAdminGuidelinesFinal2.docx*](http://www.maine.gov/dep/water/grants/319-documents/2016GrantAdminGuidelinesFinal2.docx)

1. Sub-agreements, semi-annual progress reports, final project report (Task 1)
2. Water quality analysis memo including future monitoring plan, secondary data quality assurance guide (Task 2)
3. Alternative restoration feasibility analysis, updated GIS land-cover layer, watershed modeling memo and model spreadsheet, NPS P loading estimate spreadsheet (Task 4)
4. Summary of monitoring and assessment work, Sampling and Analysis Plan (Task 3)
5. Watershed survey site spreadsheet, Ag & Forestry Survey Summary memos, Septic System Database, Septic System Vulnerability Analysis, Watershed Survey Implementation Plan (Task 5)
6. Meeting minutes, press releases (Task 6)
7. Draft and final Watershed Plan (Task 7)
8. **Project Coordinator**

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| --- | --- |
| Name | Dale Finseth, Executive Director |
| Organization | Kennebec County Soil & Water Conservation District |
| Mailing Address | 21 Enterprise Dr.; Suite #1, Augusta, ME 04330 |
| Telephone Number | 207-622-7847 x3 |
| Email Address | dale@kcswcd.org |
| DUNS number | 612139688 |

**X. Project Budget**

**Part 1. Estimated Personnel Expenses: (Grantee staff only)**

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| --- | --- | --- | --- | --- |
| **Position Name & Title** | **Hourly**  **Rate** | **Number of Hours** | **Salary & Fringe** | **Total Grantee**  **Personnel Expenses** |
| Dale Finseth, Executive Director | $50 | 10 | $500 | $500 |
| Josh Platt, Project Manager | $50 | 138 | $6,900 | $6,900 |
|  |  |  |  |  |
| **Totals** |  | **148** |  | **$7,400** |

**Part 2. Budget Estimates by Cost Category**

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| --- | --- | --- | --- |
| **Cost Category** | **Federal Funds** | **Non-Federal Match** | **Total Cost** |
| Salary & Fringe (from Part 1) | $5,750 | $1,6501 | $7,400 |
| Subgrant |  |  |  |
| Contractual | $21,025 | $14,2003 | $35,2252 |
| Donated Services – Labor |  | 11,0754 | $11,075 |
| Travel (mileage total) | $4595 |  | $459 |
| Supplies | $3566 |  | $356 |
| Other (specify) |  | $11,6507 | $11,650 |
| Indirect Costs |  |  |  |
| **Totals** | **$27,590** | **$38,575** | **$66,165** |

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| **Part 2 Notes:** Include the following, as needed:  1Cash match funds to be used by KCSWCD to hire additional technical leaders for the watershed survey.  2Contractual – Qualified Environmental Consultant: 409 hours @ $75/hr. = $30,675; Internal Loading Specialist/Limnologist: 26 hours @ 175/hr. = $4,550.  3Cash match to offset consultant costs $4,950 (KWD), $8,350 (Town of China), and $900 (CRLA).  4Donated Services-Labor – (CRLA: 89 hours @ 22.53/hr. = $2,005; Town of China: 34 hours @ $40/hr.= $1,360; KWD: 26 hours @ $50/hr. = $1,300; CLA: 38 hours @22.53/hr. = $856; Steering Committee (members not previously listed): 107 hours @ $22.53/hr. = $2,402; Technical Review Committee (members not previously listed): 91 hours @ $34.64/hr. = $3,152.  5Travel – KCSWCD travel (Task 5 and 6): 364 miles @ $0.44/mi. = $160.16. Consultant travel (Task 5 and 6): 680 miles @ $0.44/mi. = $299.20.  6Supplies – KCSWCD survey supplies (Task 5): $150. Consultant supplies: $65 (3 steering committee meetings), $65 (3 technical review committee meetings), $76 (2 stakeholder/public meetings)  7Other – Cash match contributions for additional water quality monitoring or in-lake assessments (Task 3) of $3,700 (KWD) and $1,800 (CRLA) = $5,500 Total. Cash match from CLA to cover printing costs for the final WBMP - $2,500 (Task 7). Cash match from CRLA for the creation of project web site and social media platforms: $2,000 (Task 6), and $1,650 (Town of China) to pay for additional technical leaders during the watershed survey (Task 5). |

**Part 3. Sources of Non-federal Match and Estimated Amounts**

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| **Sources of Non-federal Match** | **Amount** |
| CRLA Cash Match | $5,000 |
| CRLA In-kind Match | $2,005 |
| KWD Cash Match | $10,000 |
| KWD In-kind Match | $1,300 |
| CLA Cash Match | $2,500 |
| CLA In-kind Match | $ 856 |
| Town of China Cash Match | $10,000 |
| Town of China In-kind Match | $1,360 |
| Donated Time/Labor (watershed residents; steering/technical review committee members) | $5,554 |
| **Total** | **$38,575** |

1. Watershed area varies from 26.1 - 26.7 sq. mi. in various reports. [↑](#footnote-ref-1)
2. Colby, 2006 [↑](#footnote-ref-2)
3. ME DEP 2017 Lake Report for China Lake (Stations 1, 2 and 3) [↑](#footnote-ref-3)