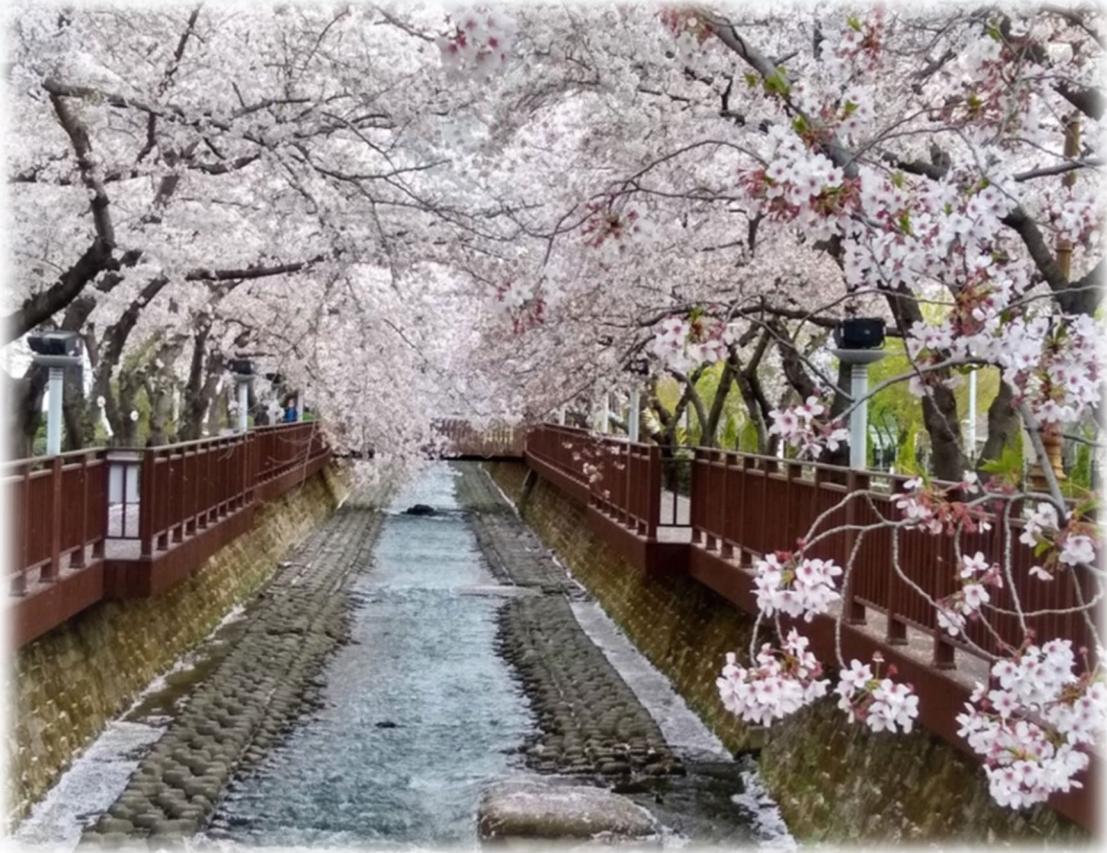




Commander Fleet Activities Chinhae

2022 Secretary of the Navy Environmental Award

Environmental Quality – Non-Industrial Installation Narratives



Cherry blossoms onboard Fleet Activities Chinhae are an identifiable part of Korean culture and reminder of the beauty of the Korean landscape.

Introduction

Commander Fleet Activities, Chinhae (CFAC) is a naval base located near the southern tip of South Korea, approximately one-hour drive (50 km) west of Busan, the country's second largest city. In addition to being the only U.S. Navy base in Mainland Asia, Chinhae is home to the Republic of Korea (ROK) Naval Academy and the country's largest navy base. CFAC serves a population of 475 military and civilian individuals working and/or living on base. It offers Sailors a small-town comfort not found in Korea's larger cities. Spacious base housing and a sense of closeness helps make Chinhae the Navy's "best kept secret." CFAC's primary mission is to provide service

and operational support to the fleet and strengthen the US-ROK alliance. It provides logistics and personnel support through joint and combined armistice, exercises, and



Fleet Activities Chinhae is located in the south of the Republic of Korea.



Commander Fleet Activities Chinhae

2022 Secretary of the Navy Environmental Award

Environmental Quality – Non-Industrial Installation Narratives



contingency operations.

Background

CFAC occupies 90 acres at the foot of a steep hillside. One third of it is forested area – the only natural environment on the base that provides habitats for numerous species of birds and wildlife. It is a challenge to develop, however innovative engineering solutions are employed to create more land that can be developed. This comes at a significant cost but is an accepted trade-off in the interest of environmental conservation.

The Environmental Management Division (EMD) is staffed with one US civilian and three Korean nationals. They are experienced and skilled professionals managing environmental programs to ensure that the US Navy activities in Korea Region comply with the Korea Environmental Governing Standards (KEGS), Navy, and applicable U.S. EPA standards. EMD personnel not only works jointly with Navy units across the region of Korea but also coordinate with host nation’s agencies and communities to implement environmental quality programs to ensure cost effectiveness and stakeholders’ involvement.

Summary of Accomplishments

Drinking Water and Partnerships

CFAC manages two drinking-water systems (WS) at Busan and Chinhae respectively, and must comply with the stringent requirements in KEGS and the Navy standards, which requires overseas WS to meet or exceed U.S. National Primary Drinking Water standards to ensure the quality of drinking water.

Certificate to Operate (CTO) Water System:
The Full CTO in February 2021 was the culmination of a two-year effort to close two significant deficiencies identified in the 2019 Sanitary Survey. CFAC attained a full CTO for Busan WS and became only the 2nd of 46

Navy WSs have earned a full CTO. This is an accomplishment worth taking note of considering the current state of affairs in onboard other U.S. bases.

Partnerships with Busan Water Authority (BWA): One of the significant deficiencies cited during the survey was Failure to Meet the U.S. Surface Water Treatment Rule (SWTR). This was very difficult to resolve because it required the host nation’s water authority to release details of the water treatment technologies and water quality monitoring data. EMD and members from NAVFAC Pacific PAC/Atlantic (LANT) worked jointly with BWA to obtain detailed information needed to document that the water quality delivered to the Busan WS by Hwamyong Water Treatment Plant (HWTP) meets or exceeds the SWTR standards. This site-specific assessment was made possible by the collaborative efforts of the host nation’s BWA Director and team (Water Quality Team, Treated Water Team, and Public Works Team). It was one the successful working groups in sharing information of drinking water treatment systems between U.S. military and the host nation - Korea. In December 2019, the



Busan Water Authority staff members (1st, 4th, and 5th from left) and Navy staff members (2nd from left: Mr. Khoi Nguyen, 3rd from left: Mr. Philip Lopez, 6th from left: Mr. Tomas See, 7th from the left: Mr. Hun Yi) pose for a group photo after the Surface Water Treatment Rule meeting.



Commander Fleet Activities Chinhae

2022 Secretary of the Navy Environmental Award

Environmental Quality – Non-Industrial Installation Narratives

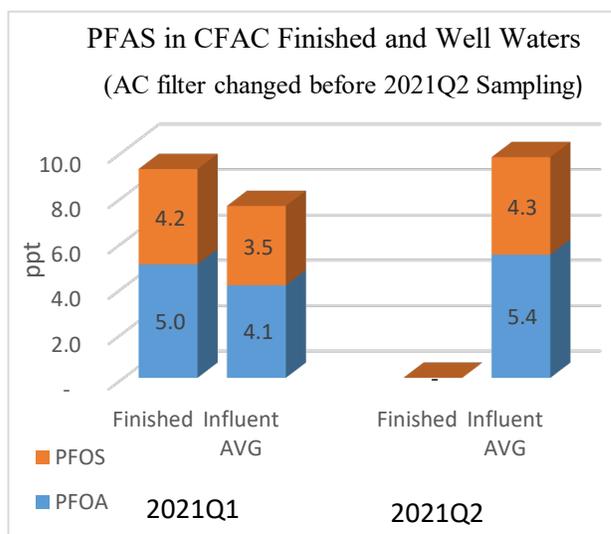


assessment team efforts provided validation that water provided by BWA is in conformance with the U.S. Navy Overseas Drinking Water SWTR requirements to safeguarding drinking water quality for Sailors, their families, and employees at the Navy installation.

Water Team Technical Competency: PW department and EMD continually resolves the remaining deficiencies to achieve another full CTO for CFAC WS. In FY21, CFAC’s staff coordinated across a number of directorates to correct nine cited deficiencies – two rated significant, five rated moderate, and two rated minor - from the FY19 sanitary survey. To resolve one of the two significant deficiencies requires technical knowledge and skills to perform a complicated 4-log virus inactivation calculation and analysis. With support from PW Utilities Branch, the analysis was thoroughly reviewed and promptly approved by the professional engineers. Resolution of the second significant deficiency required conducting a lead and copper survey for housing units and developing a sampling plan. EMD worked jointly with PW Utilities Manager to collect necessary data, produced a family housing material survey, and a sampling plan. The substantial internal effort saved the Navy approximately \$80,000. Contracting the survey out would have also been difficult because of host-nation COVID-19 restrictions. If the internal team had not accomplished the task, it would have been significantly delayed putting quality of life improvement initiatives into action.

Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water: Due to PFAS toxicity and the corresponding negative effects to the human body, the EPA established a health advisory level (HA) at 70 parts per trillion (ppt) for the individual level or the combined level of the two most toxic PFAS (perfluoro-octanoic acid (PFOA) and perfluoro-octane

sulfonic acid (PFOS). In December 2020, CFAC WS was required to sample 18 PFAS including PFOA/PFOS per DoD guidance. PFOA/PFOS levels from the CFAC and Busan WSs were report below the HA at 10.8 ppt and 18.0 ppt respectively. Since Busan WS is a purchased–water treatment system, PFAS reduction effort will reside with BWA. On the other hand, CFAC WS is owned by the Navy, CFAC Overseas Drinking Water Program (ODWP) continuously monitors the PFAS levels and takes actions if results exceed HA.



In April 2021, a change of activated carbon filters (ACF) for the CFAC WS showed that the PFAS level in finished water was effectively reduced to “undetectable”. EMD immediately implemented TOC (total organic carbon) monitoring on the effluent of the filters to catch a break-through of PFAS and determine the removal effectiveness and life cycle of the filters. Although CFAC has successfully eliminated PFAS from the finished water, the water team did not stop taking further actions. ODWP obtained an approval from the Navy Installations Command (CNIC) and initiated a water quality improvement study to identify the PFAS sources and develop effective measures to remove potential PFAS sources and to provide



Commander Fleet Activities Chinhae

2022 Secretary of the Navy Environmental Award

Environmental Quality – Non-Industrial Installation Narratives



an alternative drinking source, which is free of PFAS for a permanent solution.



The dual water-filtration system is used to purify groundwater at CFAC.

Effective Environmental Project Requirement Management (EPRM)

At the beginning of each fiscal year (FY), each media program manager (PM) helps other PMs and share their expertise in EPRM for the current and the next two following fiscal years. In addition to preparing a detailed and accurate scope of work (SOW) and a government estimate (GE) for each project requirement, the PM also identifies appropriate contracting agencies and vehicles, their capacity, and funding document acceptance lead-time. In the last quarter of FY21 the PMs have successfully executed seven previously unfunded project requirements (air emission inventory, Initial Asbestos Surveys (IAS), water quality improvement study on well water containing PFAS, and management plan updates of pesticides, solid wastes, ozone depleting substances, and radon). The projects were awarded within scope and budget in a total amount of 1.1-million dollars. The projects will help EMD use the most updated measures and regulatory standards to manage five media programs, identify potential

asbestos presence, and eliminate PFAS sources in the drinking water. Based on project execution proficiency, EMD staff is substantiated one of the highest environmental performing team. In addition, the IAS saved \$15,290 for project management and overheads fees if the buildings were surveyed in two FYs. The other six projects avoided a 2% annual inflation cost or \$19,500 for delayed execution.

Toxic Substances (Radon, Asbestos, Lead and PCB) Management

Due to elevated levels of naturally occurring radon in Chinhae, an installation-wide radon survey was conducted in 2015. The average indoor air radon level on base was 1.3 pCi/L. Only two buildings were identified with radon levels of concern (slightly higher than the EPA action level of 4 pCi/L). Radon mitigation measures that transfer radon gas away from the building to maintain a safe environment were taken at the two buildings of concern. Out of an abundance of caution, the same mitigation measures were taken at the other 34 buildings with detected radon levels below EPA action-level standards. In FY21, facing the due date of 5-year radon retest for buildings of concern and travel restrictions, EMD, with assistance from the Public Works (PW) production team, took charge of the retesting project



The toxic substance program manager conducts a radon gas mitigation system inspection.



Commander Fleet Activities Chinhae

2022 Secretary of the Navy Environmental Award

Environmental Quality – Non-Industrial Installation Narratives



requirement to survey all buildings onboard CFAC that were occupied at least four hours throughout the day to ensure that the radon levels did not exceed permissible levels during renovations, alternations, and living patterns. The proactive retesting action has met mission requirements, exceed standards, and provided cost savings of approximately \$65,000, which would have been realized if outside contractors were utilized for the project.

Asbestos Containing Materials (ACM) information for surveyed buildings is integrated into an MS Access database to allow ease of use to project engineers and O&M workers to determine presence of ACM in the project areas to protect tenants and workers from potential airborne asbestos exposure. In September 2021, a contract to survey the remaining 45 buildings for ACM was awarded to make the database completely cover all buildings on base. Currently, only six buildings are identified with ACM, and they are on an annual surveillance program to assess conditions to prevent asbestos released. Since May 2021, EMD has implemented a preventive policy, which requires all new construction projects to provide a Toxic Substances (asbestos, lead, and PCB) Free Construction Certification upon completion to protect occupants from potential exposure. The toxic-substance free certification will help eliminate future ACM survey cost for repairs and construction projects, which will disturb undocumented construction materials that potentially contain asbestos. A cost saving of \$37,500 for ACM surveys is anticipated annually.

Other than the ACM database, EMD has also established and maintained a Lead Base Paint (LBP) database, which contains almost 20

years of survey data to allow designers and maintenance personnel to determine LBP presence or additional LBP testing required for a project. The Lead Program Manager also provides responsive lead assessments to projects that potentially disturb LBP or lead containing materials. Internal LBP assessments provides cost savings of approximately \$12,000 and shortens project design time ultimately resulting in cost savings and increased efficiency.

Cultural and Natural Resources (CNR) Conservation

CFAC is not only plentiful in natural resources but also abundant in cultural resources with 14 archaeological sites and 39 cultural properties. To preserve the ample resources, CFAC updated both Integrated Natural Resources Management Plan (INRMP) and Integrated Cultural Resources Management Plan (ICRMP) with new SOPs and BMPs in FY21. The INRMP is incorporated with recent seasonal survey results of the field flora and fauna surveys to document habitats and indigenous creatures for forest management. The survey team has identified the northern-forested area as a preferred habitat for birds and small mammal like Korean squirrels and Asiatic



Educational signboards are posted along the walking and hiking trails onboard CFAC.

chipmunk species. The area will be managed



Commander Fleet Activities Chinhae

2022 Secretary of the Navy Environmental Award

Environmental Quality – Non-Industrial Installation Narratives



to ensure a healthy variety mature tree species suitable for wildlife preservation. Other than flourishing wildlife habitats, educational signboards are maintained along the hiking trail throughout the forest area for educational purposes ultimately aimed at engaging CFAC residents and visitors to aid in preserving the natural environment.

Because of the pandemic during FY21, local travel restrictions were imposed on travelers from outside districts. The travel restrictions prevented Korean cultural resource experts from traveling to Chinhae to validate and translate the local cultural resources survey (CRS) into English. CFAC Cultural and Natural Resources Manager voluntarily assessed and translated the CRS into English to be incorporated as part the ICRMP update. The in-house translation resulted a saving of \$50,000. The CRS translation also showed EMD’s dedication to sustaining the cultural resources program under unusual constraints. Throughout the base, Seibert stakes were maintained to mark the boundaries of all cultural areas and rope fences were installed to protect historical and archeological sites from being damaged as suggested by the Korea Cultural Heritage Administration and local experts. The signboards provide descriptions of the archaeological and cultural properties, as

well as their significance. This communication initiative is aimed at engaging the local population in the preservation of the area by identifying the unique nature of the environment they inhabit.

Solid Waste and Recycling

The installation-recycling program continually and proactively reduces waste materials that would otherwise be landfilled. Glass/plastic containers, steel/aluminum cans, cardboard boxes, and mixed paper are collected from housing and industrial areas and recycled through different contractors and recyclers to meet the city requirements. As a result, approximately 110 tons of recyclables and food waste were diverted from the landfills for recycling in FY20. To support the city’s food waste diversion initiative proactively food waste at the installation is collected separately from housing and eating establishments and recycled through approved recyclers.

Hazardous Waste/Hazardous Material (HW/HM) Management

CFAC always places a high value on the need to reduce the quantity of, or reuse of, Hazardous Material (HM) and strikes for replacing HM with environmentally friendly products coupled with cost effective considerations. Each HM is screened by a competent environmental professional before it is approved for use in any shop or industrial area. As a result of implementing HM inventory management, strict adherence to Authorized User List (AUL) protocols, product substitution, and base-wide inspections, the HW generations have decreased by 38% in FY18, 7% in FY19, and 50% in FY20 based on the FY14 baseline. Lead acid batteries and POL products have been actively recycled via Defense Logistics Agency contractors.



A historical building and a garden from the Japanese colonial period with a signboard explaining architectural features.



Commander Fleet Activities Chinhae

2022 Secretary of the Navy Environmental Award

Environmental Quality – Non-Industrial Installation Narratives



Environmental Management System (EMS) Education and Outreach

CFAC has a vigorous environmental program to require all personnel, including contractors working on base, to take EMS training on the Environmental Compliance Assessment Training and Tracking System to help achieve Navy's environmental goals and objectives. Additional training are also required for personnel who are assigned to operations that may have potential negative environmental impact.

On 22 April 2021, CFAC celebrated the celebrating the Earth Day with three events: base-wide cleanup and community garden planting. The event was capped off with “dirt” (Oreo) pudding served to participants as a way to build community morale and understanding of the rich environment that CFAC residents have the responsibility of preserving. Over thirty military and civilians participated in the cleanup to demonstrate support for environmental protection. The cleanup event has become the base's tradition to clean litter from parking lots and hiking trails throughout the base. In the afternoon, about twenty participants joined in painting planting boxes and soil mixing for the gardening.



The Public Works Officer conducts a safety brief prior to the base-wide cleanup.

The Earth Day was extended for two weeks to be a Bike to Work Weeks event to promote bicycles as an option for commuting to work. Some of the participants continually bike to work to show their commitment to reduce greenhouse gases to enhance local environment and community quality of life.

Conclusion

CFAC staff and leadership has consistently demonstrated a willingness to find creative and cost effective solutions to environmental sustainment and preservation. At no other time have the qualities of perseverance and creativity regarding environmental preservation been tested in such a way as they have than during the pandemic. The combination of relying on in-house talent and capabilities to provide cost savings while meeting mission coupled with an environmental program that sought to engage a wide range of stakeholders has made CFAC's environmental program a model for what is possible even during the most difficult of times.

Preserving and enhancing environmental quality for both U.S. residents and host nation personnel while supporting the Navy's mission in Korea is a testament to the dedication and hard work of CFAC personnel and a leadership team who trusts its team to find solutions to difficult problems. CFAC will continue its commitment to be an example for what is possible for small overseas installations regarding environmental preservation. The CFAC team and leadership are dedicated to encouraging environmental stewardship, reducing pollution, and creating a culture of procedural compliance that can be replicated and handed down to subsequent teams who assume the duty of protecting the rich natural environment and historic surroundings CFAC inhabits.