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PERSONNAL

Place of Birth :Ankara
Date of Birth :15.3.1964

EDUCATION

Lycée :Saint-Joseph, French High School, 1982
B.Sc. :Istanbul Technical University, Environmental Engineering, 1986
M.Sc. :Istanbul Technical University, Environmental Engineering 1989
Ph.D. :University of Pittsburgh, Environmental Engineering, USA, 1995

CAREER

2021 – Present : Director,
Boğaziçi University, Institute of Environmental Sciences, İstanbul,
Turkey

2008 - Present : Professor
Boğaziçi University, Institute of Environmental Sciences

2005-2014 : Vice Director
Boğaziçi University, Institute of Environmental Sciences

2002-2008 : Associate Professor
Boğaziçi University, Institute of Environmental Sciences

1997-2002 : Vice-Director and Assistant Professor
Boğaziçi University, Institute of Environmental Sciences

1995-1996 : Postgraduate Research Associate
Ground-Water Remediation Technologies Analysis Center
(GWRTAC), Pittsburgh, USA.

1993-1995 : Research Assistant
University of Pittsburgh, USA

1992-1993 : Teaching Assistant
University of Pittsburgh, USA

1986-1990 : Researcher
TUBİTAK MAM, Environmental Research Group.

1987-1988 : Visiting Researcher-Water Research Center, Stevenage, UK.

SPECIALITY AREAS

- Environmental System Analysis: Air-Waste-Water
- Environmental Impact Assessment
- Waste to Energy: biogas and renewable energy
- Leachate Treatment
- Soil/Groundwater Remediation
- Land Use Management

MAJOR PROJECTS INVOLVED

Pretreatment of Petrochemical Industry Wastewater Sludge by Ultrasound Assisted Chemical Methods, BAP-İSTAÇ, **Project Manager**, 2022

Policy Measures on Plastics Waste in Turkey, WWF, **Project Manager**, 2021-2022.

Energy Efficiency and Waste Management: Preparing A Zero Carbon Roadmap in BOSCH Çerkezköy Factory, BOSCH/BSH, **Project Manager**, 2021

Modeling and Analysis of Indoor and Outdoor Air Quality for Eurasia Tunnel, Yapı Merkezi-ATAŞ, **Consultant**, 2014-2020.

Removal and discharge of microplastics from wastewater treatment plants of Istanbul, Bogazici University Research Fund (BAP), **Researcher**, 2019 –2021.

Evaluation of Biodegradation of Bioplastics under Soil and Landfill Conditions, Bogazici University BAP 13521, **Project Manager**, 2017 –2019.

Biotechnological approach for recovery of rare earth elements and precious metals from ewaste – (BIOREES), Intensified Cooperation (IntenC): TÜBİTAK 113Y011, **BU Project Leader**, 2014-2017

Bioremediation (Plant-Microbe Interactions) Technology for Bioleaching Heavy Metals Contamination of Surface Soil in Industrial Area, TÜBİTAK 2221, **Supervisor**, 2015-2016

Evaluation of Phyto-remediation Technology for Bioleaching and Recovery of Metals and Rare Earth Materials from Waste of Electrical and Electronic Equipment, Bogazici University BAP 9541, **Project Manager**, 2015 –2017

The Behavior of Nanoparticules in Landfills, Bogazici University BAP 13Y00P5, **Project Manager**, 2013

Nanoparticules in Conventional and Bioreactor Landfills, TÜBİTAK 112Y322, **Project Co-Manager**, 2013

COST Action ES1205: Engineered Nanomaterials, **Project Co-Coordinator and Member of Management Committee**, 2013

Management of Domestic-Urban Wastewater Sludge, 108G190 TÜBİTAK-KAMAG, **Project Expert**, 2010-2013.

Recovery of Energy from Market Wastes, Boğaziçi University BAP 6355, **Project Manager**, 2011

Feasibility Study for Chicken Manure to Biogas Project, Ciner group, **Project Director**, 2009

Renewable Energy Networks between Turkish & European Universities (RENET), EU Project Number TR0604.01- 03/079, **Project Vice-Coordinator and member of Management Committee, 2008 – 2009**

Investigation of the Most Suitable Energy Crop for Biogas Production Boğaziçi University, O7HY 102 D, **Project Manager**, 2007-2008

COST Action 639: Greenhouse gas budget of soils under changing climate and land use (BurnOut), **Project Coordinator and member of Management Committee**, 2007- 2009.

Elazığ-Hazar Lake, Güney Village Integrated Waste Management Project: CFCU/TR0405.02/SSI, **Project Expert**, 2006.

Environmental Master Plan and Investment Strategy for the Marmara Sea Basin (MEMPIS), European Investment Bank and Turkish Ministry of Environment and Forestry Project **Project Local Expert**, 2006.

Evaluation of the Environmental Impacts of Biodegradable Municipal Solid Waste (BMSW) in Landfills, Britain-Turkey Partnerships Programme Link Project, **Project Director**, 2004.

Olive Oil Mill Wastewater Management Using Land Treatment Systems, İÇTAG-Ç040/GSRT (102I001), TUBITAK, **Project Director**, 2006.

Development of a tool for the prognosis and confrontation of forest fires and droughts in Greece and Turkey (FORFI), TOGTAG-GSRT-2002/15, TUBITAK, **Project Member**, 2004.

Feasibility Study for the Assessment of Methane Recovery Potential from the Hekimoğlu-Izmir Landfill Site, Transtek Elektrik Co., **Project Manager**, 2005.

Bioremediation of Oily Sludge by Biopiles, ELC Group Project, **Project Manager**, 2003.

Characterization of Wastewater Treatment Plant Sludges for Various Industries According to the Turkish Hazardous Waste Regulations, Asaş, and Astaş Aluminum Industries, and PEPSI Bottling Co., 2003.

Evaluation of Methane Gas Recovery from Hasdal Old Landfill Disposal Site, Boğaziçi University-İSTAÇ Joint Project, **Project Manager** 2002.

Determination of the methanogenetic activity of the acetate utilizing bacteria, Boğaziçi University, O1S1O1, **Project Manager**, 2002.

Mathematical Modelling of Leachate and Biogas Production from Sanitary Landfill Sites, Boğaziçi University, OOHY 102 D, **Project Manager**, 2001.

Heavy metal removal from the hazardous waste sludge by bioleaching, TÜBİTAK Project, YDABÇAG 199Y109, **Project Member**, 2001.

Characterization of Solid Waste and Development of the Best Management Strategies for Şişli Municipality, Project prepared for Şişli Municipality, **Project Manager**, 2001.

The Fate of Selected Heavy Metals in Simulated Landfills, Boğaziçi University, 99YO3, **Project Manager**, 2001.

Effect of Water Distribution on the Solid-Liquid Separation of Sludge, Boğaziçi University, 97HY102, **Project member**, 2000.

Preparation of the IZAYDAS Landfill Operation Guideline and training of the staff, 1999.

Municipal Landfill Stabilization with Leachate Recirculation, Boğaziçi University, 97HY101, **Project Manager**, 1999.

Gillette Factory Site Assessment for the Determination of the Hazardous Waste Contamination, **Project member**, 1999.

Evaluation of the anaerobic treatment alternatives for a pharmaceutical wastewater, Boğaziçi University, **Project member**, 1997.

Case and Data Collection for Innovative Ground-Water Remediation Techniques **Project member** at GWRTAC, Pittsburgh, USA, EPA Project, 1995.

Determination of Design and Operational Parameters for a Test Bioreactor Landfill Cell **Project member**, University of Pittsburgh, Delaware Solid Waste Authority, USA, 1994.

AFFILIATIONS:

- IWA (International Water Association)
- AEESP (Association of Environmental Engineering and Science Professors)
- University of Pittsburgh- Alumni and Representative of Turkey
- Turkish National Solid Waste Committee
- French Turkish Engineering Association

SELECTED PUBLICATIONS

Wilkinson, J. L., Boxall, A. B., Kolpin, D. W., Leung, K. M., Lai, R. W., Galbán-Malagón, C., ... & Teta, C., "Pharmaceutical pollution of the world's rivers." Proceedings of the National Academy of Sciences 119.8 (2022).

Vardar, S., Demirel, B., Onay, T.T., "Degradability of bioplastics in anaerobic digestion systems and their effects on biogas production: a review". *Rev Environ Sci Biotechnol* 21, 205–223 (2022).

Vardar, S., Onay, T.T., Demirel, B., Kideys, A. E., "Evaluation of microplastics removal efficiency at a wastewater treatment plant discharging to the Sea of Marmara, *Environmental Pollution*", 289, 117862 (2021).

Kucuker, M.A., Demirel, B., Onay, T.T., "Enhanced biogas production from chicken manure via enzymatic pretreatment", *Journal of Material Cycles and Waste Management* 22, 1521–1528, (2020).

Gokce, H.B., Arioglu, E., Coptu, N.K., Onay, T.T., Gun, B., "Exterior air quality monitoring for the Eurasia Tunnel in Istanbul, Turkey", *Science of the Total Environment*, 134312, (2020).

Akyol, C., Ozbayram, E.G., Demirel, B., Onay, T.T., Ince, O., Ince, B., "Linking nano-ZnO contamination to microbial community profiling in sanitary landfill simulations", *Environmental Science And Pollution Research*, 26, 13580-13591, (2019).

Onay, T.T., Coptu, N.K., Gokce, H.B., Aydin-Sarikurt, D., Mumcu, M., Arioglu, E., "Air quality impact assessment for the Eurasia Tunnel in Istanbul, Turkey", *Environmental Monitoring And Assessment*, 191, 195, (2019).

Di Addario, M., Temizel, I., Edes, N., Onay, T.T., Demirel, B., Coptu, N.K., Ruggeri, B., "Development of Fuzzylogic model to predict the effects of ZnO nanoparticles on methane production from simulated landfill", *Journal of Environmental Chemical Engineering*, 5, 5944-5953, (2017).

Temizel, I., Emadian, S.M., Di Addario, M., Onay, T.T., Demirel, B., Coptu, N.K., Karanfil, T. , "Effect of nano-ZnO on biogas generation from simulated landfills", *Waste Management*, 63, 18-26, (2017).

Emadian, S.M., Onay, T.T., Demirel, B., "Biodegradation of bioplastics in natural environments", *Waste Management* , 59, 526-536, (2017).

Dulger, M., Sakallioğlu, T., Temizel, I., Demirel, B., Coptu, N.K., Onay, T.T., Uyguner-Demirel, C.S., Karanfil, T. "Leaching potential of nano-scale titanium dioxide in fresh municipal solid waste" *Chemosphere*, 144, 1567-1572, (2016).

Sakallioğlu, T., Bakirdoven, M., Temizel, I., Demirel, B., Coptu, N.K., Onay, T.T., Uyguner-Demirel, C.S., Karanfil, T. "Leaching of nano-ZnO in municipal solid waste" *Journal of Hazardous Materials*, 317, 319-326, (2016).

Akyol, C., Demirel, B., Onay, T.T., "Recovery of methane from tannery sludge: the effect of inoculum to substrate ratio and solids content", *Journal of Material Cycles and Waste Management*, 17, Issue: 4, 808-8015, (2015).

Alkanok, G., Demirel, B., Onay, T. T., "Determination of biogas generation potential as a renewable energy source from supermarket wastes", *Waste Management*, 134-140, (2014).

Demirel, B., Örok, M., Hot, E., Erkişi, S., Albükrek, M., Onay, T. T., "Recovery of biogas

as a source of renewable energy from ice-cream production residues and wastewater", *Environmental Technology*, 2099-2104, (2013).

Volkan, O. H., Guney, M., Kucuker, M.A., Onay, T.T., Copty, N., Mater, B., Yenigun., O., "The impact of hazelnuts in land-use changes on soil carbon and in situ soil respiration Dynamics", *Journal of Environmental Management*, 341-349, (2013).

Demirel, B., Göl, P., Onay, T.T., "Evaluation of heavy metal content in digestate from batch anaerobic co-digestion of sunflower hulls and poultry manure", *J. Mater Cycles Waste Manag*, 15, 242-246, (2013).

Erses A.S., Oral H.V., Onay T.T., Yenigün O, "A study on olive oil mill wastewater management in Turkey: A questionnaire and experimental approach", *Resources, Conservation and Recycling*, 60: 64-71, (2012).

Wurz, A., Kuchta, K., Onay, T.T. "Review on municipal sewage sludge management in Turkey and Europe " *International Journal of Global Warming* , 3, 1-2, 116-128, (2011).

Guney, M., Zagury, G.J., Dogan, N., Onay, T.T.," Exposure assessment and risk characterization from trace elements following soil ingestion by children exposed to playgrounds, parks and picnic areas", *Journal of Hazardous Materials*, 182, 1-3, 656-664, (2010).

Onay, T.T., Copty, N.C., Demirel, B., Bacioğlu, A., "Impact of food waste fraction in municipal solid waste on sorption of heavy metals", *Waste Managment & Research*, 28, 936-943, (2010).

Demirel, B., Scherer P., Yenigün, O., Onay, T.T., "Production of methane and hydrogen from biomass through conventional and high-rate anaerobic digestion processes", *Critical Reviews in Environmental Science and Technology*, 40, 2, 116-146, (2010).

Guney, M., Onay, T. T., Copty, N.K. "Impact of overland traffic on heavy metal levels in highway dust and soils of Istanbul, Turkey", *Environ Monit Assess*, 164:101–110, (2010).

Erses, A.S., Onay, T.T., Yenigün, O., "Comparison of aerobic and anaerobic degradation of municipal solid waste in bioreactor landfills", *Bioresource Technology*, 99, 13, 5418-5426, (2008).

Erses, A.S., Fazal, M.A., Onay, T.T., Craig, W.H., "Determination of solid waste sorption capacity for selected heavy metals in landfills", *Journal of Hazardous Materials*, 121, No:1-3, 223-232, (2005).

Demirel, B., Yenigün, O., Onay, T.T., "Anaerobic treatment of dairy wastewaters: a review ", *Process Biochemistry*, 40, No:8, 2583-2595, (2005).

Cinar, S., Onay, T.T., Erdinçler, A. Codisposal Alternatives of Various Municipal Wastewater Treatment-Plant Sludges with Refuse, *Advances in Environmental Research*, 8, 477-482, (2004).

Copty, N.K., Ergene, D., Onay T.T. Stochastic Model for Landfill Gas Transport and Energy Recovery, *Journal of Environmental Engineering-ASCE*, 130, No: 9, 1042-1049, (2004).

Erses, S., Onay, T.T., "In Situ Heavy Metal Attenuation in Landfills under Methanogenic Conditions" J. Hazard. Mater. B99, 159-175, (2003).

Erses, S., Onay, T.T., "Accelerated Landfill Waste Decomposition by External Leachate Recirculation from an Old Landfill Cell" Wat. Sci. Technol, 47, No. 12, 215-222 , (2003).

Şan, I., Onay, T.T., "Impact of Various Leachate Recirculation Regimes on Municipal Solid Waste Degradation", J. Hazard. Mater. B87, 259-271, (2001).

Onay, T.T., Pohland, F.G., "Nitrogen and Sulfate Attenuation in Simulated Landfill Bioreactors", Water Science and Technology, 44, No: 2-3, 367-372, (2001).

Erdinçler, A., Köseoglu, S., Onay, T.T., "The Role of Blending in Polymer Conditioning of Waste Activated Sludge", Water Science and Technology, 44, No: 6, 63-66, (2001).

Güleç, S.B., Onay, T.T., Erdinçler, A., "Determination of the Remaining Stabilization Potential of Landfilled Solid Waste by Sludge Addition", Water Sci. and Technol, 42, 269-276, (2000).

Onay, T.T., Pohland, F.G., "In Situ Nitrogen Management in Controlled Landfills", Water Res., 32, 1383-1392 (1998).

Onay, T.T., Gönenç, İ.E., "An Application of Sludge Conditioning and Dewatering Technique: A Case Study", J. Environ. Sci. Health, A33, 3, 461-476 (1997).

Selected Proceedings

"Kriging-Based Estimation of the Change in Soil Carbon Stock in the Coastal Black Sea Region", Turkey, EGU General Assembly, (2010).

"Impact of Land Use Change on Soil Carbon in the Karasu Forest", Uluslar arası Kentleşme, Arazi Kullanımı ve Bozulması Çalıştayı, (2009).

"Karasu Ormanları'nda Görülen Arazi Kullanımının Toprak Solunumuna Olan Etkisinin Belirlenmesi", Uluslararası Çevre Sorunları Konferansı, (2009).

"Kağıt Endüstrisi Atık Sularının Bentonit ile Kimyasal Ön Artımı", 11. İTÜ Endüstriyel Kirlenme Kontrolü Sempozyumu, (2008).

"The Evolution of the Municipal Solid Waste Degradation Performance in Semi-Aerobic Landfills", Solid Waste Technology and Management, (2007).

"An Overview of Forest Fires and Meteorology in Turkey and Greece", IEEE, (2006).

"Havalı ve Havasız Biyoreaktör Teknolojisi Kullanarak Eysel Katı Atık Stabilizasyonun İncelenmesi", 10. İTÜ Endüstriyel Kirlenme Kontrolü Sempozyumu, (2006).

"TEM Otoyolu Elmalı Barajı Bölgesi Topraktaki Ağır Metal Kirliliğinin Belirlenmesi", 11. İTÜ Endüstriyel Kirlenme Kontrolü Sempozyumu, (2006).

"Codisposal of Various Sludges with Municipal Solid Waste in Landfills", 1st IWA-ASPIRE Conference and Exhibition, (2005).

"Olive Oil Industries in Turkey: A Survey Study", IWA International Conference on Water Economics, Statics, and Finance Rethymno, (2005).

“Anaerobic Decomposition of BMSW in Landfills with Respect to the EU Landfill Directive in İstanbul”, 10th World Anaerobic Digestion Congress, (2004).

Erses, A.S., and Onay T.T. “Evaluation of Operational Strategies in Landfills for Accelerated Waste Stabilization”, the Nineteenth International Conference on Solid Waste Technology and Management, Philadelphia, USA, March, 21-24 2004.

Onay T.T., Erses, A.S., Kuijten, S., and Craig, W.H. “Anaerobic Decomposition of BMSW in Landfills with Respect to the Eu Landfill Directive in İstanbul”, 10th World Congress- Anaerobic Digestion 2004 Anaerobic Bioconversion for Sustainability, August 29 - September 2, 2004 Montréal (Canada) (poster).

Eren, T., Onay, T.T. ve Copty, N. “Modeling of Leachate Production from the İzaydaş Sanitary Landfill”, IWA 2th World Water Congress, Berlin, Almanya, Ekim, 2001 (poster).

Erses, A.S., and Onay, T.T. “*In Situ* Removal of the Selected Heavy Metals in Landfills Under Methanogenetic Conditions”, 9th World Congress Anaerobic Digestion 2001, Antwerpen, Belgium, September, 2001 (Poster).

Çınar, S., Onay, T.T. and Erdinçler, A. “Co-disposal Alternatives of Various Municipal Wastewater Treatment Plant Sludges with Refuse”, *IWA Sludge Management Entering the 3rd Millennium-Industrial, Combined Water and Wastewater Residues*, Taipei, 193-198, Taiwan , 2001.

Aralp, L.C., Erdinçler, A. and Onay, T.T. “Heavy Metal Removal from the Wastewater and Leachate Co-treatment Sludge by Sulfur Oxidizing Bacteria”, *IWA Sludge Management Entering the 3rd Millennium-Industrial, Combined Water and Wastewater Residues*, Taipei, 52-57, Taiwan , 2001.

Çınar, S. and Onay, T.T. “The Suitability of Various Municipal Wastewater Treatment Plant Sludges for Codisposal with Refuse”, *The 16th International Conference on Solid Waste Technology and Management*, Philadelphia, 996-1002, Philadelphia USA, 2000.

Onay, T.T. and Pohland, F.G. “Nitrogen and Sulfate Attenuation in Simulated Landfill Bioreactors”, *1st World Congress of the International Water Association*, Vol. 4, 327-332, Paris, 2000.

Erdinçler, A., Köseoğlu, S. and Onay, T.T. “ The Role of Blending on Sludge Polymer Conditioning”, *Managing Water and Waste in the New Millennium*, Midrand/Johannesburg, 3D-1, South Africa, 2000.

Erdinçler, A. and Onay, T.T. “Development of a Management Strategy for Mixed Waste Paper in İstanbul Metropolitan Area”, *7th International Waste Management and Landfill Symposium*, Vol. V, 243-247, Cagliari, 1999.

Onay, T.T. and Pohland, F.G. “Nitrogen and Sulfate Removal in Municipal Solid Landfills with *in situ* Autotrophic Denitrification”, *II. International Symposium on Anaerobic Digestion of Solid Waste*, Vol. II, 224-227, Barcelona, 1999.

Onay, T.T. and Pohland, F.G., “*In Situ* Nitrogen Management in Landfills with Leachate Recirculation”, *SWANA’s 1st Annual Landfill Symposium*, 3-18, Wilmington, Delaware, 1996.

Onay, T.T. and Pohland, F.G., "*In Situ* Nitrification in Controlled Landfills", *ASCE-CSCE Environmental Engineering Conference in Pittsburgh*, 652-659, Pennsylvania, 1995.

Onay, T.T. and Pohland, F.G., "*In Situ* Denitrification in Controlled Landfills", *the 50th Purdue Industrial Waste Conference*, 297-302, Purdue University, West LaFayette, 1995.

GRADUATE STUDENTS

Master Students

Suat Vardar: Removal and Discharge of Microplastics from the Wastewater Treatment Plants in Istanbul, 2020.

Berivan Ülger: Evaluation of Bioplastics Biodegradation Under Landfill Conditions, 2019.

Merve Melda Temizel: Biodegradability of PLA and PET Based Plastics in Soil, 2019.

Mehmet Meriç Tunalı: Plant and Microbe Interactions in the Phytoremediation of Heavy Metal Contaminated Soil, 2015.

Mümine Dülger: Leaching Behaviour of nano-Titanium Dioxide in Municipal Solid Waste, 2014.

Merve Harmankaya: Impacts of sewage sludge codisposal on waste degradation in aerobic and anaerobic bioreactors, 2013.

Gizem Alkanok: Determination of biogas production potential from various supermarket wastes, 2013.

Nefise Pınar Göl: Evaluation of Biogas Production as a Source of Renewable Energy Through Co-Digestion of Agricultural Residues and Poultry Manure, 2012.

Elif Hot: Investigation of Waste Stabilization Potential of A Medium Aged Solid Waste In A Bioreactor Landfill, 2012.

Gülnaz Pola: Impact of Rice Husk as Litter Material on Biogas Generation from Chicken Manure, 2011.

Mehmet Ali Küçüker: Kriging-based Estimation of the Change in Soil Carbon Stock in the Karasu Coastal Black Sea Region of Turkey, 2011.

Nurten Doğan: Potential Intake and Risk Characterization of Heavy Metals Due to Ingestion of Soils from Parks, Playgrounds and Picnic Areas, 2010.

Mert Güney: Heavy Metal Determination in Roadside Soils and Highway Dust from the Major Highways of İstanbul, 2006.

Alper Cıngır: Mathematical Modeling of a Biogas Recovery Systems at the İzaydaş Kocaeli Sanitary Landfill, 2004.

Asiye Bacioğlu: Sorption Behaviour of Heavy Metals or Solid Waste Matrix in Landfills, 2004.

Gülşah Genç: Comparison of Fluff Layer Composition with the Underlying Sediments in the Black Sea, 2004.

Didar Ergene: Modeling of Biogas Generation and Transport at the Kemberburgaz (Hasdal) Waste Disposal Site, 2002.

Cem Kural: Optimization of Glass Collection for its Recovery: A Case Study, 2002.

S.Birkan Aykan: A State-of-the-Art Design Technique in Landfill Engineering: A Case Study, 2001.

Tolga Eren: Modeling of Leachate Production from the İzaydaş Sanitary Landfill, 2001.

Suna Erses: In Situ Immobilization of the Selected Heavy Metals by Sulfide Compounds in Landfills Under Methanogenetic Conditions, 2001.

Suna Çınar: Effect of Various Type of Sludge Codisposal on the Solid Waste Stabilization in Landfills, 2001.

İrem Şan: Evaluation of in Situ Leachate Management Alternatives on Municipal Solid Waste Stabilization in Sanitary Landfills, 1999.

Ş. Başak Güleç: Determination of the Remaining Stabilization Potential of Landfilled Solid Waste by Sludge Addition, 1999.

Doctoral Students

İlknur Temizel: The Fate and Behaviour of Nano-ZnO in Conventional and Bioreactor Landfills (Continued)

Volkan Oral: Impacts of Land Use Change on Soil Respiration and Carbon in the Forest of Karasu District, 2010.

Suna Erses: Sustainable Solid Waste Management and in-Situ Attenuation Mechanisms in Landfills Under Aerobic and Anaerobic Conditions, 2008.

Berivan Ülger Vatansever: PhD student

Suat Vardar: PhD student