



REPUBLIC OF SERBIA
MINISTRY OF ENVIRONMENTAL PROTECTION

ENVIRONMENTAL IMPACT ASSESSMENT STUDY OF PROJECT OF CONSTRUCTION OF WIND FARM ON THE LOCALITY OF KOSTOLAC



**EKO PLAN -PLANIRANJE, PROJEKTOVANJE I
INŽENJERING U OBLASTI ZAŠTITE ŽIVOTNE
SREDINE**

Sergeja Jesenjina 16, 11080 Beograd, www.eko-plan.rs



**NETINVEST D.O.O. - INŽENJERING, STUDIJE
OPRAVDANOSTI, KONSALTING**

Trg Nikole Pašića 1, 11000 Beograd, www.netinvest.rs

Belgrade, August 2018

DOCUMENTATION TITLE: ENVIRONMENTAL IMPACT ASSESSMENT
STUDY OF PROJECT OF CONSTRUCTION OF
WIND FARM ON THE LOCALITY OF KOSTOLAC

PROJECT HOLDER: Public enterprise "Elektroprivreda Srbije"
Balkanska 13
Belgrade

**REPRESENTATIVE OF THE
PROJECT HOLDER:** dr Milka Domazet, PhD Eng.

STUDY PROCESSORS: EKO PLAN (www.eko-plan.rs)
Sergeja Jesenjina 16
Belgrade
Biljana Knežević, dipl. ing. techn. (director)

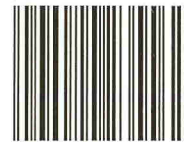
NETINVEST (www.netinvest.rs)
Trg Nikole Pašića 1
Beograd
Zoran Butulija, dipl.eng.el. (director)

**STUDY DEVELOPMENT
EXPERT TEAM:** dr Boško Josimović, PhD, senior research associate,
head of study

dr Milan Paunović, PhD biology
Marko Raković, dipl. biology
Sonja Mudri-Stojnić, dipl. ecology
Biljana Knežević, dipl. ing. techn.
Ivan Stanković, dipl. ing. arch.
Ladislav Nikolic, dipl. ing. civ.
Jovan Jovanović, dipl. ing. mach.
Zoran Butulija, dipl. ing. el.
Filip Kanački, MSc Arch.
Vera Blažon, dipl. env. analyst



Република Србија
Агенција за привредне регистре



5000020235562

АПР - Регистар привредних субјеката

Број БП 98745/2009

Датум 14.07.2009 године
Београд

Агенција за привредне регистре, Регистратор који води Регистар привредних субјеката, на основу чл. 4. Закона о агенцији за привредне регистре (Службени гласник РС бр. 55/04), чл. 23. став 2. и чл. 25. Закона о регистрацији привредних субјеката (Службени гласник РС бр. 55/04 и 61/05), решавајући по поднетој јединственој регистрационој пријави за регистрацију предузетника, поднетој од стране:

Име и презиме: Биљана Кнежевић
ЈМБГ: 2108969715158

доноси:

РЕШЕЊЕ

Усваја се захтев подносиоца јединствене регистрационе пријаве. У Регистар привредних субјеката региструје се **предузетник**:

Оснивач-предузетник:

Име и презиме: Биљана Кнежевић
ЈМБГ: 2108969715158
Адреса: Прегревица 18, Београд-Земун, Србија

Пуно пословно име предузетника:

**BILJANA KNEŽEVIĆ PR, AGENCIJA ZA PROJEKTOVANJE I INŽENJERING
EKO PLAN, ZEMUN, PREGREVICA 18**

Назив: **EKO PLAN**

Пословно седиште: Прегревица 18, Београд-Земун, Србија
Број и назив поште: 11080

Регистарски број/Матични број: **61532609**

ПИБ додељен од Пореске Управе РС: **106205064**

Почетак обављања делатности: **14.07.2009** године
Претежна делатност: **74203** - Инжењеринг
Облик обављања делатности: самосталан

Предузетник се региструје на: неодређено време

Контакт подаци:

Телефон 1: +381 (0)64 2307407

Факс: +381 (0)11 2611049

Е-пошта: blik@naclanu.com



Образложење

Решавајући по поднетој јединственој регистрационој пријави за регистрацију оснивања и упис у јединственој регистар пореских обвезника, предузетника BILJANA KNEŽEVIĆ PR, AGENCIJA ZA PROJEKTOVANJE I INŽENJERING EKO PLAN, ZEMUN, PREGREVICA 18, БП 98745/2009 од 10.07.2009 -год., с обзиром да су испуњени услови из члана 22. Закона о регистрацији привредних субјеката и члана 26. Закона о пореском поступку и пореској администрацији (Сл. гласник РС бр. 80/02..20/09), Регистратор је одлучио као у диспозитиву.

Висина накнаде за регистрацију у износу од 540,00 динара одређена је у складу са чланом 7. Уредбе о висини накнаде за регистрацију и друге услуге које пружа Агенција за привредне регистре РС (Службени гласник РС бр. 109/05).

Поука о правном леку:

Против овог решења може се изјавити жалба Министру надлежном за послове привреде РС, у року од 8 дана од дана пријема решења, а преко Агенције за привредне регистре.

РЕГИСТРАТОР

Миладин Маглов



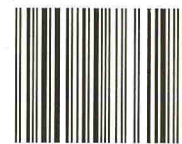
ОБАВЕШТЕЊЕ:

У обавези сте да се у року од 8 дана од дана регистрације пријавите Фонду ПНО

У обавези сте да се у року од 8 дана од дана регистрације пријавите РЗЗО



Република Србија
Агенција за привредне регистре



5000020766196

Регистар привредних субјеката

Број БП 106432/2009

Датум 23.07.2009
Београд

Агенција за привредне регистре, Регистратор који води регистар привредних субјеката, на основу чл. 4. Закона о агенцији за привредне регистре (Службени гласник РС бр.55/04), чл. 23. став 2. и чл. 25. Закона о регистрацији привредних субјеката (Службени гласник РС бр.55/04 и 61/05), решавајући по захтеву за регистрацију промене података који је поднет од стране:

Име и презиме: Снежана Петровић

доноси:

РЕШЕЊЕ

Усваја се захтев подносиоца регистрационе пријаве. У Регистар привредних субјеката региструју се **промене података о предузетнику:**

BILJANA KNEŽEVIĆ PR, AGENCIJA ZA PROJEKTOVANJE I INŽENJERING EKO PLAN,
ZEMUN, PREGREVICA 18

Матични број: 61532609

и то следећа промена:

- **Промена пословног седишта:**

Брише се:

Седиште: Прегревица 18, Београд-Земун, Србија
Број и назив поште: 11080

Уписује се:

Седиште: Сергеја Јесењина 16, Београд-Земун, Србија
Број и назив поште: 11185

- **Промена пуног пословног имена:**

Брише се:

BILJANA KNEŽEVIĆ PR, AGENCIJA ZA PROJEKTOVANJE I INŽENJERING EKO PLAN,
ZEMUN, PREGREVICA 18

Уписује се:

BILJANA KNEŽEVIĆ PR, AGENCIJA ZA PROJEKTOVANJE I INŽENJERING
EKO PLAN, ZEMUN, SERGEJA JESENJINA 16

Образложење

Подносилац регистрационе пријаве поднео је дана 22.07.2009 регистрациону пријаву за регистрацију промене података о привредном субјекту уписаном у Регистар привредних субјеката као:

BILJANA KNEŽEVIĆ PR, AGENCIJA ZA PROJEKTOVANJE I INŽENJERING EKO PLAN,
ZEMUN, PREGREVICA 18

Решавајући по захтеву подносиоца регистрационе пријаве, с обзиром да су испуњени законом прописани услови, Регистратор је одлучио као у диспозитиву.

Висина накнаде за регистрацију у износу од 300,00 динара одређена је у складу са чланом 7., 8., 9., и 10. Уредбе о висини накнаде за регистрацију и друге услуге које пружа Агенција за привредне регистре РС (Службени гласник РС број 109/05).

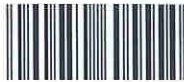
Поука о правном леку:

Против овог решења може се изјавити жалба
Министру надлежном за послове привреде РС,
у року од 8 дана од дана пријема решења,
а преко Агенције за привредне регистре.



РЕГИСТРАТОР

Миладин Маглов



8000050605554

**ИЗВОД О
РЕГИСТРАЦИЈИ
ПРИВРЕДНОГ СУБЈЕКТА**Република Србија
Агенција за привредне регистре**ОСНОВНИ ИДЕНТИФИКАЦИОНИ ПОДАТАК**

Матични / Регистарски број 06204201

СТАТУС

Статус привредног субјекта Активно привредно друштво

ПРАВНА ФОРМА

Правна форма Друштво са ограниченом одговорношћу

ПОСЛОВНО ИМЕПословно име NETINVEST PREDUZEĆE ZA PROIZVODNJU, PROMET I USLUGE
DOO, BEOGRAD (STARI GRAD)

Скраћено пословно име NETINVEST DOO BEOGRAD

ПОДАЦИ О АДРЕСАМА**Адреса седишта**

Општина Београд-Стари Град

Место Београд-Стари Град

Улица Трг Николе Пашића

Број и слово 1

Спрат, број стана и слово М / 5 /

ПОСЛОВНИ ПОДАЦИ**Подаци оснивања**

Датум оснивања 20. октобар 1992

Време трајања

Време трајања привредног субјекта Неограничено

Претежна делатност

Шифра делатности 7112

Назив делатности

Инжењерске делатности и техничко саветовање

Остали идентификациони подаци

Порески Идентификациони Број (ПИБ) 100053452

Подаци од значаја за правни промет

Текући рачуни

170-0039006024002-77
200-2707780101003-53
200-2707780101033-60
160-0000000366961-46
170-0000000001188-39
190-0070100049919-84
190-0000000016760-50
170-0039006024017-32
170-0039006024009-56
250-1540000235770-77
170-0039006024006-65
250-1540000204070-20
170-0039006024004-71

**Подаци о статусу / оснивачком акту**

Не постоји обавеза овере измена оснивачког акта

Датум важећег статуса

Датум важећег оснивачког акта

Законски (статутарни) заступници**Физичка лица**

1. Име Презиме
ЈМБГ
Функција
Ограничење супотписом

Чланови / Сувласници**Подаци о члану**Име и презиме ЈМБГ **Подаци о капиталу****Новчани**

износ

датум

Уписан: 178.335,27 RSD

износ

датум

Уписан: 300.000,00 RSD

износ

датум

Уплаћен: 178.335,27 RSD	23. август 2001	
износ	датум	
Уплаћен: 300.000,00 RSD	8. новембар 2013	
Неновчани		
вредност	датум	опис
Уписан: 29.150,42 RSD		у стварима
вредност	датум	опис
Унет: 29.150,42 RSD	30. новембар 2004	у стварима
износ(%)		
Сувласништво удела од	100,00000	

Основни капитал друштва		
Новчани		
износ	датум	
Уписан: 300.000,00 RSD		
износ	датум	
Уписан: 178.335,27 RSD		
износ	датум	
Уплаћен: 178.335,27 RSD	23. август 2001	
износ	датум	
Уплаћен: 300.000,00 RSD	8. новембар 2013	
Неновчани		
вредност	датум	опис
Уписан: 29.150,42 RSD		у стварима
вредност	датум	опис
Унет: 29.150,42 RSD	30. новембар 2004	у стварима

Регистратор, Миладин Маглов





ИНЖЕЊЕРСКА КОМОРА СРБИЈЕ

ЛИЦЕНЦА

ОДГОВОРНОГ ПЛАНЕРА

На основу Закона о планирању и изградњи и
Статута Инжењерске коморе Србије

УПРАВНИ ОДБОР ИНЖЕЊЕРСКЕ КОМОРЕ СРБИЈЕ
утврђује да је

Бошко Д. Јосимовић

дипломирани просторни планер

ЈМБ 1807974710026

одговорни планер

Број лиценце

100 0141 09



У Београду,
24. децембра 2009. године

ПРЕДСЕДНИК КОМОРЕ

Проф. др Драгослав Шумарац
дипл. грађ. инж.



ИНЖЕЊЕРСКА КОМОРА СРБИЈЕ

ЛИЦЕНЦА

ОДГОВОРНОГ УРБАНИСТЕ

На основу Закона о планирању и изградњи и
Статута Инжењерске коморе Србије

УПРАВНИ ОДБОР ИНЖЕЊЕРСКЕ КОМОРЕ СРБИЈЕ
утврђује да је

Филип С. Каначки

дипломирани инжењер архитектуре
ЛИБ 07082079258

одговорни урбаниста

за руковођење израдом урбанистичких планова и урбанистичких пројеката

Број лиценце

200 1514 15



ПРЕДСЕДНИК КОМОРЕ

Проф. др Миласав Дамњановић
дипл. инж. арх.

У Београду,
9. јула 2015. године



ИНЖЕЊЕРСКА КОМОРА СРБИЈЕ

ЛИЦЕНЦИА

ОДГОВОРНОГ ПРОЈЕКТАНТА

На основу Закона о планирању и изградњи и
Статута Инжењерске коморе Србије

УПРАВНИ ОДБОР ИНЖЕЊЕРСКЕ КОМОРЕ СРБИЈЕ
утврђује да је

Владислав Д. Николић

дипломирани грађевински инжењер

ЈМБ 2108950714037

одговорни пројектант

грађевинских конструкција објеката високоградње, нискоградње и
хидроградње

Број лиценце

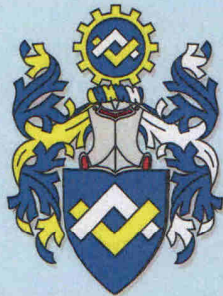
310 G621 08



У Београду,
18. септембра 2008. године

ПРЕДСЕДНИК КОМОРЕ

Проф. др Драгослав Шумарац
дипл. грађ. инж.



ИНЖЕЊЕРСКА КОМОРА СРБИЈЕ

ЛИЦЕНЦА

ОДГОВОРНОГ ПРОЈЕКТАНТА

На основу Закона о планирању и изградњи и
Статута Инжењерске коморе Србије

УПРАВНИ ОДБОР ИНЖЕЊЕРСКЕ КОМОРЕ СРБИЈЕ
утврђује да је

Јован М. Јовановић

дипломирани машински инжењер

ЛИБ 08081068312

одговорни пројектант

термотехнике, термоенергетике, процесне и гасне технике

Број лиценце

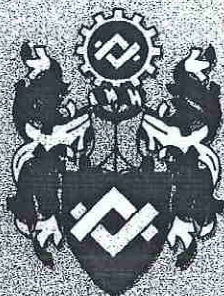
330 M272 13



ПРЕДСЕДНИК КОМОРЕ

Милован Главоњић
дипл. инж. ел.

У Београду,
9. маја 2013. године



ИНЖЕЊЕРСКА КОМОРА СРБИЈЕ

ЛИЦЕНЦА

ОДГОВОРНОГ ПРОЈЕКТАНТА

На основу Закона о планирању и изградњи и
Статута Инжењерске коморе Србије

УПРАВНИ ОДБОР ИНЖЕЊЕРСКЕ КОМОРЕ СРБИЈЕ
утврђује да је

Зоран О. Бутулија

дипломирани инжењер електротехнике

JMB 1504963153955

одговорни пројектант

електроенергетских инсталација ниског и средњег напона

Број лиценце

350 F505 07



У Београду,
15. новембра 2007. године

ПРЕДСЕДНИК КОМОРЕ

Проф. др Драгослав Штумирац
дипл. грађ. инж.



Република Србија
МИНИСТАРСТВО ПОЉОПРИВРЕДЕ
И ЗАШТИТЕ ЖИВОТНЕ СРЕДИНЕ

Број: 353-02-01621/2016-16

Датум: 13.09.2016.

ЈАВНО ПРЕДУЗЕЋЕ „ЕЛЕКТРОПРИВРЕДА С

ПРИМЉЕНО: 23-09-2016			
Орг. јед.	Број	Вид	Датум
1200	1201	353/1/58	

На основу чл. 14. и 32. Закона о процени утицаја на животну средину («Сл. гласник РС», 135/04 и 36/09), чл. 3. Конвенције о процени утицаја на животну средину у прекограничном контексту („Сл. гласник РС“ 102/07), чл. 192. став 1. Закона о општем управном поступку („Сл. лист СРЈ“, 33/97, 31/01 и „Сл. гласник РС“, 30/10), члана 5. и члана 37. став 5. Закона о министарствима („Сл. гласник РС“, 44/2014), члана 23. став 2. и члана 24. став 2. Закона о државној управи („Сл. гласник РС“, 79/2005, 101/2007, 95/2010 и 99/2014), поступајући по захтеву носиоца пројекта, ЈП ЕЛЕКТРОПРИВРЕДА СРБИЈЕ, из Београда, Царице Милице 2, Министарство пољопривреде и заштите животне средине доноси

РЕШЕЊЕ

1. ОДРЕЂУЈЕ се обим и садржај Студије о процени утицаја на животну средину Пројекта изградње парка ветроелектрана на локалитету Костолца на: КП 429, 452/1, 468, 475, 522, 547 и 612 КО Брадарац, КП 2896, 2482/1, 1433 и 1417 КО Кленовник, КП 1550 и 1551 КО Ђириковац и КП 2604 и 1640/1 КО Костолац-село, територија Града Пожаревца, од укупно 20 ветроагрегата снаге 3,3 MW и укупне инсталисане снаге 66 MW, предвиђен Просторним планом подручја посебне намене Костолачког угљеног басена („Сл. гласник РС“, 1/2013).
2. Обавеза носиоца пројекта је да Студију изради у свему према чл. 17. Закона о процени утицаја на животну средину („Сл. гласник РС“, 135/04 и 36/09) и чл. 1-10 Правилника о садржини студије о процени утицаја на животну средину („Сл. гласник РС“ 69/05) и обавезама које проистичу из Конвенције о процени утицаја на животну средину у прекограничном контексту („Сл. гласник РС“ 102/07).
3. Нетехнички краћи приказ података наведених у студији израдити као посебан сепарат студије који садржи кључне изводе и податке из свих поглавља студије, написане једноставним нетехничким језиком, са мерама заштите животне средине и програмом праћења утицаја на животну средину, који се наводе у интегралном тексту из студије.
4. Уз студију о процени утицаја приложити копије услова и сагласности других надлежних органа и организација издатих у складу са посебним законом.
5. Носилац пројекта дужан је да, у року од годину дана од дана коначности овог решења, поднесе захтев за давање сагласности на студију о процени утицаја пројекта на животну средину из тачке 1. овог решења.

Образложење

Носилац пројекта ЈП ЕЛЕКТРОПРИВРЕДА СРБИЈЕ из Београда, Царице Милице 2, обратио се овом органу захтевом бр. 353-02-01621/2016-16 од 08.08.2016. године, за одређивање обима и садржаја Студије о процени утицаја на животну средину Пројекта изградње парка ветроелектрана на локалитету Костолац на: КП 429, 452/1, 468, 475, 522, 547 и 612 КО Брадарац, КП 2896, 2482/1, 1433 и 1417 КО Кленовник, КП 1550 и 1551 КО Ђириковац и КП 2604 и 1640/1 КО Костолац-село, територија Града Пожаревца, од укупно 20 ветроагрегата снаге 3,3 MW и укупне инсталисане снаге 66 MW, предвиђен Просторним планом подручја посебне намене Костолачког угљеног басена („Сл. гласник РС“, 1/2013).

Уз захтев и упитнике достављени су:

- Информација о локацији бр. 350-01-04615/2016-14 од 02.08.2016. коју је издало Министарство грађевинарства, саобраћаја и инфраструктуре;
- Графички прилог макро и микролокације ветроелектране Костолац;
- Решење Завода за заштиту природе Србије бр. 03 020-2775/2 од 29.12.2014.
- Решење о условима за израду пројектне документације за изградњу ветропарка Костолац бр. 399/2 -2014 од 16.12.2014. које је издао Регионални завод за заштиту споменика културе из Смедерева;
- Услови за израду техничке документације бр 14207/1 од 08.12.2014. које је дало ЈП СРБИЈАШУМЕ;
- Услови за израду техничке документације бр 06-03/22517 од 22.01.2015. које је дало ЈП СРБИЈАГАС;
- Услови ТЕЛЕКОМ СРБИЈА АД бр. 382821/2-2014 од 02.02.2014.;
- Извод из идејног пројекта изградње парка ветроелектрана на локалитету Костолац са ситуационим планом планираних зона изградње, који је израдио НЕТИНВЕСТ PR/EP5-VPK/16 из Београда, Теразије 12/V;
- Мониторинг птица и слепих мишева за потребе пројекта изградње ветроелектране Костолац који је израдио FAUNA C&M из Нових Бановаца, Земунска 19;
- Информација о предложеним активностима изградње 20 ветроагрегата са пратећим елементима за експлоатацију на локалитету Костолац, у складу са чл. 32. Закона о процени утицаја на животну средину («Службени гласник РС», број 135/04 и 36/09) и чл. 3. Конвенције о процени утицаја на животну средину у прекограничном контексту („Сл. гласник РС“ 102/07) на српском и енглеском језику;

Поступајући по предметном захтеву овај орган је, обавестио заинтересоване органе, организације и јавност, организовао јавни увид и обезбедио доступност података из захтева и документације носиоца пројекта, путем штампаних медија (оглас у листу “Данас” од 15.08.2016.) и преко сајта Министарства, сходно одредбама члана 14., а у вези са чланом 29. Закона о процени утицаја на животну средину.

Коментаре су у законском року је доставила НВО Центар за екологију и одрживи развој (ЦЕКОР) из Суботице, Корзо 15/13.

Примедбе се односе на: могућност кумулативног ефекта са ефектима других пројеката у вези са изворима буке, рекултивацијом подручја захваћеног рударством и пратећим индустријским активностима, миграционе руте птица (мрежа НАТУРА 2000), као и утицај саобраћајница које повезују насеља у локалу.

Планирани пројекат предвиђа изградњу комплекса ветроелектране Костолац на просторима спољних одлагалишта и јаловишта у Костолцу, настала као последица рударских активности. Комплекс се састоји од следећих функционалних подцелина:

- Ветроагрегата који представљају генераторске јединице и састоје се од ротора, гондоле, торња и темеља, напонског нивоа 690 kV/35 kV;
- Унутрашње кабловске мреже (подземни кабловски водови напонског нивоа 35k V;
- Трафо станице 35 kV/110 kV са командном и управном зградом преко које се ветроелектрана прикључује на преносни систем ради пласмана произведене електричне енергије и одакле се управља радом електране;
- Приступних путева, који се може поклапати са са трасом унутрашње кабловске мреже делимично, или у потпуности;

Ветроелектрана се састоји од инфраструктурних објеката за производњу електричне енергије, објеката за пренос енергије, приступних саобраћајница и простире се на захвату од 60 km², тако да се заузима површина од 20 m² испод сваког ветроагрегата (тачкаста примена), док темељна стопа која је укопана има радијус до 25 метара. Предвиђено је позиционирање 20 ветроагрегата појединачне снаге 3,3 MW, тако да је укупна инсталисана снага 66 MW.

Сагласно чл. 32. Закона о процени утицаја на животну средину («Сл. гласник РС», број 135/04 и 36/09) и чл. 3. Конвенције о процени утицаја на животну средину у прекограничном контексту („Сл. гласник РС“ 102/07), попуњени обрасци на српском и енглеском језику постављени су на сајт Министарства и у електронској форми прослеђени Републици Румунији, због потенцијалног прекограничног утицаја пројекта на животну средину.

Уредбом Владе Србије утврђена је Листа пројеката за које је обавезна процена утицаја и Листе пројеката за које се може захтевати процена утицаја на животну средину („Сл. гласник РС“ 114/08), при чему се предметни пројекат –уређаји за коришћење снаге ветра у циљу производње електричне енергије (фарме ветрењача) може се сврстати у тачку 3. подтачка 3) – Производња енергије, Листе пројеката за које се може захтевати процена утицаја на животну средину.

Неповољни утицаји ветроелектрана на животну окружење представљају ризици на увећање морталитета птица и слепих мишева, повећање буке током рада, као и на доминантни визуелни аспект подручја. Такође, екстремни хаваријски акциденти могу да доведу до делимичног загађења земљишта.

У складу са тим, а на основу члана 14. и члана 17. Закона о процени утицаја на животну средину («Службени гласник РС», број 135/04 и 36/09), као и на основу члана 1. и чланова 2. до 10. Правилника о садржини студије о процени утицаја на животну средину («Службени гласник РС», број 69/05), утврђен је обим и садржај предметне студије.


У вези са изложеним, утврђена је обавеза носиоца пројекта да, у року од годину дана од дана коначности овог решења, поднесе захтев за давање сагласности на студију о процени утицаја пројекта на животну средину из тачке 1. овог решења.

Плаћена је републичка административна такса у износу од 1 920,00,00 динара у складу са Законом о републичким административним таксама („Сл. гласник РС“ 47/13 и 57/2014), тарифни број 186.

ПОУКА О ПРАВНОМ ЛЕКУ: Против овог решења може се уложити жалба Влади Републике Србије путем овог органа у року од 15 дана од дана пријема решења, односно од дана обавештавања заинтересоване јавности о донетом решењу.

Доставити:

-наслову
-архиви


Помоћник министра
По решењу о овлашћењу
бр. 021-01-43/2016-01 од 17.08.2016.

Александар Весић

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1. INTRODUCTION

Pursuant to the Law on Planning and Construction (Official Gazette of RS No. 72/2009, 81/2009, 24/2011 and 145/14), for the objects over 50 meters high, facilities for electricity generation of 10 MW and more, electricity lines of transformer stations of voltage 110 kV and more; facilities for the production of energy from renewable energy sources with a capacity of 10 MW or more, a construction permit is issued by the Ministry in charge of civil engineering affairs (according to Article 133 of the Law), and based on the Project for Construction Permit with accompanying documentation, which, among other things, contains Environmental Impact Assessment Study.

A special document defines a list of projects/facilities for which environmental impact assessment is mandatory (Regulation on the establishment of a list of projects for which an environmental impact assessment is mandatory and projects for which an environmental impact assessment can be required, Official Gazette of the Republic of Serbia, No. 114/2008). According to this Regulation, facilities for the production of electricity in wind farms exceeding 10 MW and 110 kV transmission lines are on List II, so they can be requested for the development of a Study on Environmental Impact Assessment.

The Law on the Environmental Impact Assessment (Official Gazette of RS No. 135/04, 36/09) defines the procedure of impact assessment for projects that can have significant impacts on the environment, which includes:

- defining the contents of the Environmental Impact Assessment Study by the Competent Authority, abased on the Request submitted by the Investor,
- implementation of the process of participation of interested bodies and organizations and the public at all development phases of the Study,
- cross-border notification by the Competent Authority for projects that may have significant impacts on the environment of another state,
- implementation of the process of drafting and approving the study, which results in the approval of the study or the refusal of a study by the Competent Authority,
- supervision and other issues of importance for environmental impact assessment.

In accordance with the above, the Ministry of Agriculture and Environmental Protection of the Republic of Serbia, within its competencies and in accordance with the provisions of the Law on Environmental Impact Assessment (Official Gazette of RS, No. 135/04 and 36/09), and upon the request of the project holder PE „Elektroprivreda Srbije“, adopted a Decision determining the need for development and determining the scope and content of the on the Environmental Impact Assessment Study of the project for Construction of wind farm on the locality of Kostolac (Decision No: 353-02-01621/2016 -16, dated September 13, 2016).

For the needs of the Study, the project holder PE "Elektroprivreda Srbije" conducted the public procurement procedure - JN/1000/0162/2016, after which the work was awarded to the company NETINVET d.o.o. from Belgrade (Service Provider) and company EKO PLAN from Belgrade (a member of the group), who gathered a multidisciplinary team for the development of the subject Study, which is usually a part of the documentation needed in the process of obtaining approval for the construction and preparation of the remaining documentation.

In the preparation phase of the appropriate technical documentation necessary for the start of the project implementation, the Project holder has conducted consultations with the relevant institutions and provided the decisions, opinions, conditions and approvals of the relevant institutions as guidelines for the implementation of the project.

The complex of the planned wind power plant involves the construction/installation of 20 wind turbines, an internal cable network (underground cable lines of 35kV voltage level), a 35/110kV substation with command and administrative building, access roads and a temporary delivery point for the delivery of equipment. The realization of the project that is the subject of the Study is fully in line with the national policy in the field of renewable energy sources (RES) formulated in the Energy Development Strategy of the Republic of Serbia until 2025 with projections until 2030 ("Official Gazette of RS" No. 101/2015) . Its realization will have multiple significance both in terms of positive environmental impact and in terms of increasing the share of RES in total electricity production.

When deciding on the location of the Kostolac wind farm and planning the spatial disposition of individual wind turbines, the principle of preventive environment protection and its factors was applied in order to prevent or minimize possible negative impacts. Regarding the selection of the location of the wind farm, the starting point was innovative and it involved the implementation of the project on devastated soil, which in this case in the previous period was used for mining activities. In doing so, account was taken of the necessary distances from the objects on which the realization and exploitation of the project could have an impact (noise, shadowing, etc.) In the context of the preventive protection of the flying fauna, ie the determination of the appropriate/optimal spatial disposition of the wind turbines, a one-year monitoring of the impact of the subject project was carried out on ornithofauna and hiropterofauna, which analyzed the potentially dominant effects of planned purposes on environmental elements, and the results of monitoring were incorporated into this Study, as an integral part of the text, and in Annex I of the Study. In addition, other observations (phoenix and floristic-vegetation) have been carried out in order to fully understand the existing state of the environment at the project location and identify the possible impacts of the project on the environmental elements.

The task of this Study is to analyze in detail the possible positive and negative impacts of the planned project of the Kostolac wind farm on the environment and on the basis of the obtained results, anticipate the appropriate measures by which the positive impacts will be maintained in the estimated frameworks and the negative impacts would be minimized or completely eliminated.

Main information on project holder:

Name: Public Enterprise “Elektroprivreda Srbije“

Adress: Balkanska 13, 11000 Belgrade

e-mail: milka.domazet@eps.rs

Contact person: dr Milka Domazet, phone: 064/8333-445

PE Elektroprivreda Srbije is a company with activities in the field of energy, which with this and some other projects, emphasizes the production of electricity from renewable sources. The plan of the company is realization of projects in the field of wind energy and other forms of energy produced from renewable sources, raising collective awareness about the

importance of applying renewable energy sources (RES) and improving the energy portfolio of the Republic of Serbia in this area.

2. SITE DESCRIPTION

2.1. Physical-geographic characteristics of the site

The locations of the planned Kostolac wind farm are located in the territory of Pozarevac in the Branicevo district, between the towns of Kostolac and Pozarevac and about 14km by the air line from the border with Romania (Figure 2.1) east of them.

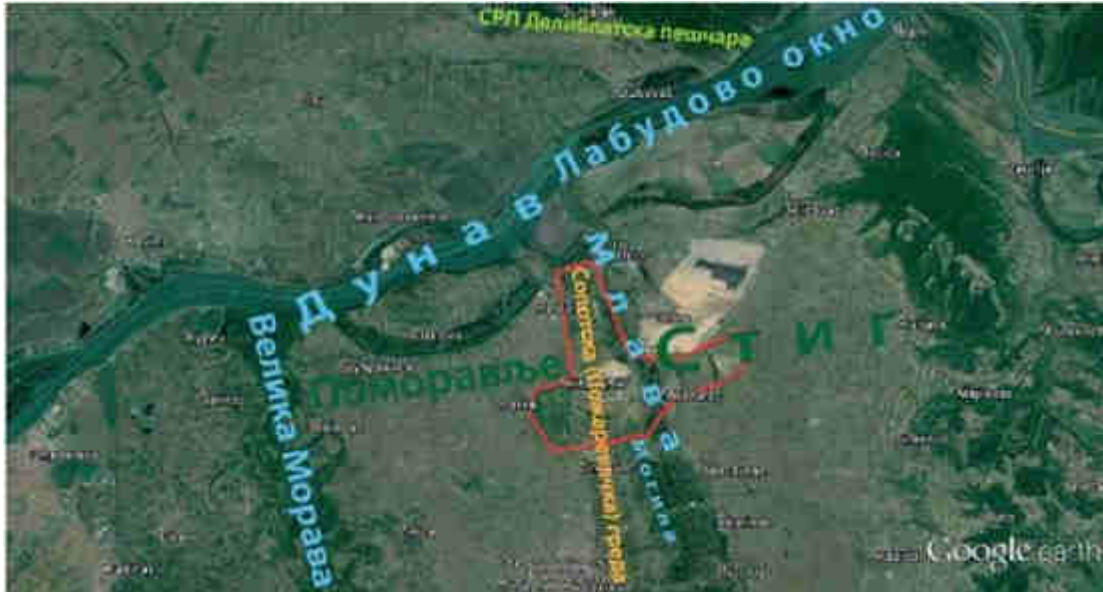


Figure 2.1. Position of the planned Kostolac wind farm in relation to the wider environment

All four locations of the wind power plant are mostly recultivated landfills of the Kostolac coal basin in the area of predominantly agricultural land and the zones of mining activities and thermal power complexes and settlements.



Figure 2.2. View from the Sopotska greda at the location Kostolac on the staged anthropogenic relief of the closed surface mine Klenovnik and the lower plain region of Pomoravlje

Locations of the planned wind farm, with an altitude range of approximately 100 to 135 m above sea level (in some places even more, with a maximum altitude of 174 m), dominate the

surrounding lowland peripanonian area of Pomoravlje and Stig (Figure 2.2) - alluvial plains of Velika Morava and Mlava, whose altitude is mainly in the range of 75 to 80 m. The natural border between these two plains, and drainage divide of their basins, is Sopotska (Pozarevacka) greda, in which zone most of the locations of the wind farm are located - Ćirikovac and Klenovnik. Location Drmno is located in the east, in the Stiska plain, and the location of Petka west, in Pomoravlje, but both in the immediate vicinity of Sopotska greda (about 3 km, or about 1.5 km). In comparison with the surrounding plains, the location of the wind farm, except for higher altitudes, is characterized by an extremely stratified relief, mainly as a result of anthropogenic activities (digging of ore and deposition of tailings).

In biogeographical terms, the site is located in the mezian province, characterized by the original forest vegetation and biomes of predominantly southern and submediterranean deciduous forests, and due to the presence of numerous water courses and stagnant waters and azonal vegetation of aquatic and humid habitats (Figure 2.3). However, in the greater part of the mezian province, the original vegetation and autochthonous ecosystems are highly reduced, fragmented and transformed by centuries of anthropogenic activities, mostly in agrobiocenosis, and these processes continue. This typical situation with the dominance of agrobiocenosis is characteristic for most of this area.



Figure 2.3. Elements of preserved autochthonous forest, humid and aquatic habitats in the vicinity of the site are only present in the Mlava and Mogila rivers zone



Figure 2.4. Anthropogenic forest plantations and agroecosystems at the location of Petka



Figure 2.5. Mining and thermoenergetic infrastructure dominates the landscape - Thermal power plant Kostolac B and surface mine Drmno

Location Drmno is located south of the surface mine Drmno, and east of vilage Bradarac. It covers an area of approximately 2.4 km². It is located on a tailings exteral landfill that is formed in the form of stages, slopes and cupped piles, of different widths and heights. The thickness of the fill layer is about 50 m, and the highest altitude of the terrain is about 141 m above sea level. Upon completion of taililngs deposit, the site was recultivated. In the immediate vicinity of the location there are no populated places.

The closest populated place is Bradarac, about 1.2 km from the border of the location, ie about 1.4 km from the position of the nearest wind generators. The largest part is covered with ruderal grassy vegetation, while the woody and shrubberous vegetation is present only in the form of smaller forests and shrubs, as well as individual trees and small groups (Figure 2.6), with only one larger fragment in the central part. Wood-shrubby vegetation, dense complex (mainly slugs and scrubs), is represented only on slopes and at the base.

At the location and in the immediate vicinity, there are no aquatic and humid habitats or agricultural land.

There are no buildings on the site, but there are several hunting feeders waiting in a rather deserted state. North of the location, at a distance of 400-500 m from the border and about 700 m from the position of the nearest wind turbine, there is a complex of facilities of the Administration of the Surface mine Drmno which have a certain, but not high, cryptic potential for bats.

Of all locations, this is characterized by the smallest, low, trophic and cryptic potential for both birds and bats.



Figure 2.6. The central plateau of the Drmno site

Location Čirikovac is located on the alluvial plain of the river Mogila and partly on the Sopotska greda, west of the stream of the Mlava River, south of the surface mine Čirikovac, southeast of the settlement of Klenovnik and northeast of the settlement Čirikovac. The location represents the external and part of the internal landfill of the surface mine Čirikovac. It covers an area of about 1.7 km². The thickness of the deposited layer is 10-40 m, and the altitude ranges 75-130 m above sea level.

Near the border of the location is Klenovnik settlement, but the positions of the nearest wind generators are about 1.4 km away from it, so the positions of the wind generators are closer to the Čirikovac settlement - the closest to only 800 m. Significant part of the site is covered with low woody and shrubby vegetation, mostly shrike and forestry dominated by acacia and poplar, which is why the terrain is relatively unpredictable and difficult to pass, and peripheral are also agricultural areas and grassland vegetation.

A large part of the site occupies an ash landfill with a water surface whose marginal parts and the surrounding area are swamped at its lowest positions (Figure 2.7) - there are several zones

of floatant and swamp vegetation of the bulrush type, with thick bushy vegetation in the outer zones, which provides an abundance of cryptic conditions for numerous types of birds and other animals. On the southwestern border of the site, at a distance of 500-650 m from the position of the nearest wind turbine, there is a complex of facilities of the Administration of surface mine Ćirikovac, which have a certain cryptic potential for bats and small songbirds, as well as individual trees within this complex.

Overall, this site has a moderate cryptic and trophic potential for birds, while for bats it has moderate trophic and low cryptic potential, but potential shelters are in close proximity.



Figure 2.7. Ash landfill in the central part of the site Ćirikovac with swamped bordering and the surrounding area

Location Petka (Figure 2.8) is located south-east of the settlement of the same name, southwest of the settlement of Klenovnik and the surface mine Ćirikovac and northwest of the settlement Ćirikovac. It covers an area of approximately 2.64 km². The location is a tailings landfill from surface mine Ćirikovac. The thickness of the deposit layer is about 60 m, and the highest altitude of the terrain is about 136 m above sea level.

The closest settlement is Klenovnik, which is located against the border of the location, but the position of the nearest wind turbine is about 750 m. Ćirikovac settlement is about 350 m from the border, and about 1.2 km from the position of the nearest wind turbine, while the Petka settlement is about 750 m away from the border of the location, and about 1 km from the position of the nearest wind turbine.

The site represents a successful example of land recultivation and is characterized by relatively developed forest vegetation, with agricultural areas - fields, meadows and lucerries. At the foot of the location towards Ćirikovac there are artificial stands of black pine, while the greater part of the footh and slopes of the site is covered with dense forests of acacia and poplar trees. Much of the site's plateau is covered with woody vegetation dominated by acacia and poplar trees, but mostly shrubbery of very thick structure (Figure 2.8), or young plantations.

At the site and in the immediate vicinity there are no aquatic and humid habitats. In the eastern part of the site there is a waste dumpsite. On the site there are no buildings, only a few game feeders. In the immediate vicinity, there are few individual facilities (for example, within the hothouse near the eastern border of the site), and at a distance of less than 500 m are the closest facilities to the settlements of Klenovnik and Ćirikovac, as well as the complex of the facilities of the surface mine Ćirikovac.

This location has relatively high cryptic and trophic potential for birds, while for bats it has high trophic, but low cryptic potential.



Figure 2.8. The hard-to-pass shrubbery and scrub dominate the central plateau of the Petka site

Location Klenovnik (Figure 2.9) is the only part that represents the natural part of the terrain, that is, the Sopotska greda, which on the western part borders with the closed Klenovnik surface mine, and in the far south with the closed surface of Ćirikovac. It covers an area of approximately 3.3 km². The terrain is extremely stratified with a highest altitude of about 174 m above sea level. At the very border of the location is the settlement of Stari Kostolac, from which the positions of the nearest wind turbines are about 500 m away, as well as from the settlement Kostolac, which is about 200 m away from the border. The settlement Klenovnik is about 400 m away from the border of the location, but about 1,1 km from the position of the nearest wind turbine. On the site there are grassy, bushy and woody vegetation, and in some parts, especially in the west, in the pockets of deposited tailings, a system of a larger number of smaller and several large stagnant waters with a whole complex of water, swamp and wetlands has been formed on the surface of almost 1 km². In the immediate vicinity of the site, at a distance of 0.5 to 2 km, there are complexes of aquatic and humid habitats of the Mlava, Dunavac and Danube rivers.

Although the area of the eastern slope of the Sopotska greda in this zone is categorized as a forest in the Spatial Plan, here, except in the narrow zone along the Mlava River, there is no forest, but fragments of shrubbery and scabs with very rare individual trees. There are also several loess sections that have a cryptic potential for certain species of birds, mainly on the edge of the mentioned depression with humid habitats (Figure 2.9), but also landslides that prevent their nesting in these places in the south of the site. There are landfills of municipal

waste along the northwestern and northeastern boundary of the site. and scabs with very rare individual trees. There are also several wood sections that have a cryptic potential for certain species of birds, mainly on the edge of the mentioned depression with wet habitats (Figure 2.9), but also landslides that prevent their nesting in these places in the south of the site. There are landfills of municipal waste along the northwestern and northeastern boundary of the site.

On the site there are 3 buildings of grange type and one cottage with low cryptic potential for bats. North of the site, the coal conveyor belt passes through with functional lighting. Some parts of this site have very high cryptic and trophic potential for birds, while for bats they have high trophic, but low cryptic potential.



Figure 2.9. At the site Klenovnik are represented aquatic and humid habitats and loess sections

In this area there are no protected natural areas or areas proposed for protection (Official Gazette of RS, No. 88/2010a), as well as elements of the ecological network of Serbia (Official Gazette of RS, No. 102/2010).



Figure 2.10. View of Labudovo okno from the fortress Ramse

However, in the immediate vicinity of the site, just 1.5 km northeast of the location, there is Labudovo okno (Figure 2.10) - a complex of river and aquatic habitats of the Danube in the Deliblatska pescara area. The largest part of this complex, that is, the Banat bottomland and the Danube River between Dubovac and Stara Palanka, Dubovački rit, Zilovo island and

Čibuklija and the confluence of the river Karas, is covered by the boundaries of the Special Nature Reserve (SNR) Deliblatska pešćara (Official Gazette RS, No. 3/02, 81/08).

A wider area that includes the entire Danube stream from the Nera river confluence and the border with Romania to the confluence of Mlava river, including the area around the Nera river confluence, Zavojska island as well as the narrow coastal belt on the right bank of the Danube also has the status of a protected area protected by the Convention on Wetlands of international significance, especially as a marsh birds habitat (Official Gazette of SFRY, No. 9/1977), so-called Ramsar area (national code 3RS005, number 1655). This area is the most important breeding ground, wintering station and migratory station of birds of aquatic and humid habitats in Serbia and as such has the status of an international and national significant bird area (IBA - Important Bird Area) with the IBA code RS016IBA and as such it also enters the ecological network of Serbia (Official Gazette of the RS, No. 102/2010). With an even longer part of the Danube and a wider coastal belt on both sides, this area, i.e. Donje Podunavlje, is proposed for protection by the current Spatial Plan of the Republic of Serbia until 2020 (Official Gazette of the RS, No. 88/2010). Also, in this area in neighboring Romania, the Porcile de Fier National Park is connected. The south-western border of the SNR Deliblatska pešćara is about 4 km from the site, and Deliblatska pešćara itself is about 7 km on the other side of the Danube. This space was placed "... under protection as the largest European area built from the layers of Eolian sand with expressive forms of the dune relief and characteristic sandstone, steppe and forest ecosystems, with a unique mosaic of life communities and typical and specific representatives of flora and fauna. Many of them are natural rarities ... (strictly protected and protected species) ... significant according to international criteria ... "(Official Gazette of RS, No. 3/02, 81/08). Deliblatska pešćara also has the IBA status, with the code RS015IBA, (Official Gazette RS, No. 102/2010). With 180 recorded bird species and 21 species of bats (data from the author of the Monitoring of the flying fauna), is one of the most important centers of diversity of bird fauna and bat fauna in Serbia. However, due to the separation from the location with the wide Danube valley zone and intensive anthropogenic activities of highly altered habitats, the possible impact of Deliblatska pešćara proximity on the condition of the bat fauna on the site is negligible. Also, in the immediate vicinity of the site, at a distance of about 1.5 km north of the location, there is the Danube river, and about 7 km west is the Velika Morava River. The valleys of the Velika Morava and, in particular, the Danube are very important European migration corridors both of birds and bats during the spring and autumn period, due to which its streams with coastal belts are protected by law as ecological corridors of international importance and part of the ecological network of Serbia (Official Gazette RS, No. 102/2010). Directly along the boundary of the site, and partly within the boundaries, the valleys of the Mlava and Mogila rivers, which are characterized by relatively preserved aquatic, humid and indigenous forest habitats (Figure 2.11), which is very little in the wider area of the site.



Figure 2.11. River Mlava near the location of the planned Kostolac wind farm

2.2. Natural characteristics and conditions

2.2.1. Geomorphological characteristics of the terrain

The wider area of the Kostolac Mining and Energy Basin is plain, with a low level rugged foothills of terrace character. The plains of Stig, Podunavlje and Donje Pomoravlje and two ridges – Sopotska greda and Boževačka kosa stand out. The ridges extend north-south, almost parallel.

The western ridge (Sopotska greda) is lower and narrower, and it is located in the center of the subject area. Within this ridge are the heights of Leštar east of Kostolac (175 m) and Čačalica (200 m) on the eastern edge of the town of Požarevac.

The eastern ridge (Boževačka kosa) is located in the eastern part of the area and represents the eastern border of the Kostolac coal basin. From the village of Kličevac and Rečica it gradually rises and extends southward towards the wider foothill. At the ridges erosion cut (mainly in loess) more larger and smaller ravines ("prokop"), with subvertical sides of height and up to 20 m.

Plain Stig extends between the Boževačka kosa and Sopotska greda, which is around Mlava and Mogila rivers, in a zone with a width of up to 10 km, with terrain altitude roughly under 100 m. Over Klepec ridge it crosses into the Dunavac and Danube aluvion. To the west of the Sopotska greda is also a plain, with terrain altitudes below 100 m, which is known as Podunavlje along the Danube, and to the south as Pomoravlje (Figure 2.12).



Figure 2.12. Basic geomorphological elements in the exploration area (based on Google Earth view)

The existing morphology of the terrain has been significantly changed due to the long-term surface exploitation of coal on surface mines (SM) "Drmno", SM "Klenovnik" and SM "Ćirikovac" with accompanying tailings landfills and large deposits of slag and ash from TPP Kostolac A and Kostolac B. The spatial position of the named, artificially formed, morphological forms is shown in Figure 2.13.

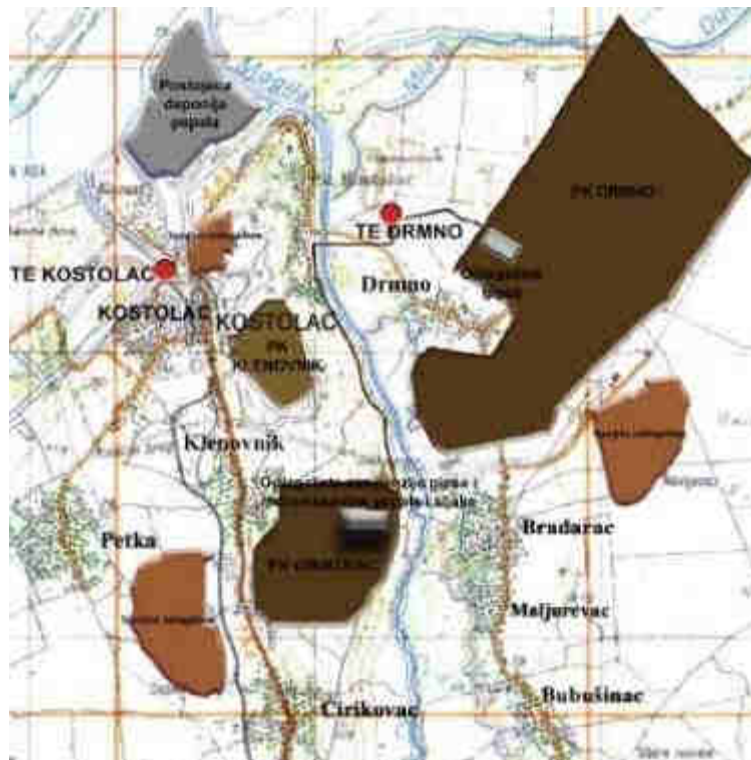


Figure 2.13. A schematic map of contemporary morphological shapes formed as a result of the operation of mines and thermal power plants

It is similar with the changes in the relief in the originally flat Stig - south and east of Drmno (SM "Drmno", with coal overburden deposits). A view of the external deposit of coal overburden of SM Drmno is shown in Figure 2.14.



Figure 2.14. *View of the external coal overburden landfill within SM Drmno*

Velika Morava, and partly Mlava, were typical plain rivers with frequent changes in the riverbed, a large number of meanders, oxbow lakes and old riverbeds. Modern morphology in this part of the terrain has been changed, as a consequence of the regulation of the riverbed and the exploitation of gravel.

2.2.2. Flora and fauna

The characteristics of the flora and fauna at the site and its surroundings were elaborated under point 2.1. Based on this, it can be concluded that the plant and animal world at the site is highly degraded and altered under the influence of anthropogenic factors. Former natural vegetation was replaced by agricultural crops and mining activities that created new ecological conditions. Natural vegetation was kept only on small surfaces.

In the wider surroundings of the area planned for the construction of a wind farm intensively cultivated fields dominate, i.e. agrobiocenosis, with predominantly one-year crops. In addition, populated areas with associated infrastructure, as well as surface mines, industrial-energy facilities and accompanying infrastructure (power lines, roads, etc.) contribute to the general ecosystem disturbance. The remains of the original ecosystems, primarily forest and aquatic, in the wider surroundings are present in the river valleys of the Mlava and Mogila. Locations where the installation of wind turbines is planned are spatially disturbed by surface exploitation and landfilling of tailings and ash. Because of mining works, the original vegetation was removed, and the ruderal (weed) vegetation developed spontaneously, which is, depending on the location, in different stages of succession. Woody and bushy vegetation is present sporadically, predominantly in the form of thicket, shrubbery and individual trees. They spontaneously covered the area, and partly they were planted for the purpose of recultivation.

The animal world does not differ much from that which is present in other plain parts of Vojvodina. The abundance of insects and other small animals provides rich food for frogs, snakes, who are the basis of the diet of numerous swamp and migratory birds (wild ducks, geese, mussels, gray and white herons and pheasants).

At the site of the wind farm there are no protected natural areas or areas proposed for protection (Official Gazette of RS, No. 88/2010), as well as the elements of the ecological network of Serbia (Official Gazette of the RS, No. 102/2010). The location of the temporary lightering site is planned in the area of the Central area of the ecological network of Serbia "Deliblatska peščara", on the right bank of the Mlava/Mogila near the confluence of the Danube. The subject area is included in the named central area as an important bird area - IBA (Important Bird Area).

2.2.2.1. Butterflies fauna

Monitoring of the daily butterflies in the area planned for the construction of the wind farm "Kostolac" in 2015 and 2016 recorded total 53 species of daily butterflies. Part of the data was collected during bird monitoring, and targeted field visits for butterfly monitoring were evenly distributed with a 10 day interval between 2 consecutive field visits (a total of 10 field days). Butterflies were captured by an entomological net and identified using a key for species identification, while the disputable individuals are photographed by a digital camera and subsequently identified. During each visit of the subject site, all planned micro-location of the pillars were observed in the immediate vicinity. In Table 2.1. is a list of recorded types of day butterflies. The number of individuals of these species varied and generally increased from spring to summer, and decreased from August.

Table 2.1. Recorded types of daily butterflies at the subject site by IUCN categorization

Scientific name of the species	Common name	IUCN categorization
Family Hesperidae	Skelari, vetropiri	
<i>Erynnis tages</i>	Tamni skelar	LC – least concern
<i>Spialia orbifer</i>	Dinjicina hesperida	LC - least concern
<i>Pyrgus malvae</i>	Slezova hesperida	LC - least concern
<i>Thymelicus lineola</i>	Smeđi skelar	LC - least concern
<i>Hesperia comma</i>	Livadski skelar	LC - least concern
<i>Ochlodes venata</i>	Riđi skelar	LC - least concern
Family Papilionidae	Jedrilci	
<i>Zerynthia polyxena</i>	Uskršnji leptir	LC - least concern
<i>Parnassius mnemosyne</i>	Mnemosine	LC - least concern
<i>Iphioides podalirius</i>	Vetrilo, jedrilac	LC - least concern
<i>Papilio machaon</i>	Lastin rep	LC - least concern
Family Pieridae	Belci	
<i>Leptidea sinapis</i>	Gorušičin belac	LC - least concern
<i>Anthocharis cardamines</i>	Zorica	LC - least concern
<i>Aporia crataegi</i>	Glogovnjak	LC - least concern
<i>Pieris brassicae</i>	Veliki kupusar	LC - least concern
<i>Pieris rapae</i>	Mali kupusar	LC - least concern
<i>Pieris napi</i>	Žiličasti kupusar	LC - least concern
<i>Colias crocea</i>	Šafranovac	LC - least concern
<i>Gonepteryx rhamni</i>	Žutac, limunovac	LC - least concern

Scientific name of the species	Common name	IUCN categorization
Family Lycaenidae	Plavci	
<i>Lycaena virgaureae</i>	Dukat	LC - least concern
<i>Lycaena alciphron</i>	Kiseljakov dukat	NT – near threatened
<i>Satyrrium acaciae</i>	Mali repkar	LC - least concern
<i>Celastrina argiolus</i>	Krkovin plavac	LC - least concern
<i>Scolitantides orion</i>	Žednjakov plavac	NT - near threatened
<i>Plebeius argus</i>	Stooki plavac	LC - least concern
<i>Polyommatus daphnis</i>	Krzavi plavac	LC - least concern
<i>Polyommatus bellargus</i>	Potkovičar	LC - least concern
<i>Polyommatus coridon</i>	Srebrnkasti plavac	LC - least concern
Family Nymphalidae	Šarenci	
<i>Argynnis paphia</i>	Gospodak	LC - least concern
<i>Argynnis aglaja</i>	Velika sedefica	LC - least concern
<i>Argynnis adippe</i>	LJubičina sedefica	LC - least concern
<i>Issoria lathonia</i>	Mala sedefica	LC - least concern
<i>Brenthis daphne</i>	Karirana sedefica	LC - least concern
<i>Brenthis hecate</i>	Beloglavičar	LC - least concern
<i>Vanessa atalanta</i>	Admiral, lepotić	LC - least concern
<i>Vanessa cardui</i>	Stričkovac, lisica	LC - least concern
<i>Aglais io</i>	Paunovac	LC - least concern
<i>Aglais urticae</i>	Koprivar	LC - least concern
<i>Polygonia c- album</i>	Riđa sedefica	LC - least concern
<i>Arachnia levana</i>	Šumska riđa	LC - least concern
<i>Nymphalis antiopa</i>	Mrtvački plašt	LC - least concern
<i>Nymphalis polychloros</i>	Veliki koprivar	VU - vulnerable
<i>Melitaea cinxia</i>	Obični šarenac	LC - least concern
<i>Melitaea aurelia</i>	Zlatni šarenac	LC - least concern
<i>Limenitis populi</i>	Veliki topolnjak	LC - least concern
<i>Neptis sappho</i>	Grahorovac	LC - least concern
<i>Apatura ilia</i>	Mali prelivac	LC - least concern
<i>Apatura iris</i>	Talasnjak	LC - least concern
<i>Lasiommata megera</i>	Zidni okaš	LC - least concern
<i>Lasiommata maera</i>	Veliki okaš	LC - least concern
<i>Coenonympha pamphilus</i>	Mali satir	LC - least concern
<i>Pyronia tithonus</i>	Vratar	LC - least concern
<i>Maniola jurtina</i>	Volovsko oko	LC - least concern
<i>Melanargia galathea</i>	Šah- tabla	LC - least concern

From the family plavci (Lycaenidae) at the site, two species were identified, which according to the IUCN classification were marked as almost endangered. These two species were recorded in a small number at the location of the Cirikovac-Petka landfill, as well as in the area near the ash deposit on the Klenovnik locality. At these sites, but not near microlocation of wind turbines, there are plant breeders of these two species, *Rumex acetosa* and *Sedum sp.* These species are local, but widespread butterfly species in the area of Serbia, south of the Sava and Danube. In eastern Serbia, these two species are recorded in many localities. One vulnerable species according to the IUCN classification was recorded from the *Nymphalidae* family. This is a veliki koprivar (*Nymphalis polychloros*) recorded only at the site of the Drmno landfill. Nutritious caterpillar plants of this polyphagous species are numerous representatives of the genera *Ulmus*, *Salix*, *Prunus*, *Malus*, *Populus*, *Sorbus*, *Crataegus*, which are present at all subject locations within the future wind farm "Kostolac". The population of this type of butterflies is stable in Serbia, and this species is widespread.

Below, in Table 2.2 the list is given with recorded species that are protected by the national legislation, i.e. according to the Law on Nature Protection, i.e. Rulebook on the designation and protection of strictly protected and protected wild species of plants, animals and fungi (Official Gazette of RS, No. 5/2010 and 47/2011).

Table 2.2. Registered protected species of butterflies according to the regulations of Serbia

Scientific name of the species	Common name	National legislation
Family Papilionidae	Jedrilci	
<i>Zerynthia polyxena</i>	Uskršnji leptir	strictly protected species
<i>Parnassius mnemosyne</i>	Mnemosine	strictly protected species
<i>Papilio machaon</i>	Lastin rep	strictly protected species
Family Pieridae	Belci	
<i>Pieris brassicae</i>	Veliki kupusar	strictly protected species
Family Lycaenidae	Plaveci	
<i>Satyrrium acaciae</i>	Mali repkar	strictly protected species
Family Nymphalidae	Šarenci	
<i>Nymphalis antiopa</i>	Mrtvački plašt	strictly protected species
<i>Limenitis populi</i>	Veliki topolnjak	strictly protected species
<i>Apatura ilia</i>	Mali prelivac	strictly protected species
<i>Apatura iris</i>	Talasnjak	strictly protected species

Out of 53 total recorded species of daily butterflies, 10 species are strictly protected by domestic laws (Table 2). It is interesting that none of the 10 recorded strictly protected species is endangered according to the IUCN classification. All recorded strictly protected species at the site are relatively rare. They were recorded only few times, except for the veliki kupusar and lastin rep that has been found on several occasions at almost all micro sites. Species of veliki topolnjak, mali prelivac and talasnjak are related to the presence of the river nearby and were not found on the micro-locations of future wind turbines. In the immediate vicinity of the potential wind farm "Kostolac" there are no selected areas for daily butterflies. The nearest *PBA* (*Protected Butterfly Area*) is the *PBA03* "Deliblatska peščara", which is about 10 km from the nearest wind turbine, separated by the river Danube as a barrier. The second nearest *PBA* area is *PBA05* «Djerdap», which is about 30 km away. According to previous research, 88 species of daily butterflies were recorded in the selected area *PBA03* (Deliblatska peščara) (Jakšić 2008). This selected area hosts nationally significant populations of the following butterflies species:

- *Zerynthia polyxena*
- *Parnassius mnemosyne*
- *Colias myrmidone*
- *Lycaena dispar*
- *Glaucopsyche alexis*

According to previous research, 104 species of daily butterflies were recorded in the selected area *PBA05* (Djerdap) (Jakšić 2008). This selected area hosts nationally significant populations of the following butterflies species:

- *Thymelicus acteon*
- *Lycaena dispar*

- *Scolitantides orion*
- *Nymphalis xanthomelas*
- *Nymphalis vaualbum*
- *Euphydryas maturna*
- *Melitaea aurelia*
- *Erebia medusa*

2.2.3. Climate characteristics

The area of the Drmno and Kostolac mining and energy basins, as part of the southern periphery of the Pannonian Basin, is characterized by a moderate continental climate that emphasizes steppe-continental climatic influences of neighbouring Banat. The characteristics of this climate are colder winters and warmer summers. The main source of data for the climate analysis are the long-term measurements carried out by the Republic Hydrometeorological Institute of Serbia at the Main Weather Station Veliko Gradiste, 27 km east of the Thermal Power Plant, which is climatologically representative for the subject area. The text below gives the average monthly and annual temperatures and relative humidity, monthly and annual atmospheric rainfall for the period from 1983 to 2012 and the data of wind measurements for the location of the planned wind farm Kostolac.

Air temperature

The mean annual air temperature is 11.4 °C, and the mean annual amplitude of air temperature fluctuations is 21.7 °C. The coldest month is January with a mean monthly temperature of 0.3 °C, and the hottest month is July with a mean temperature of 22.1 °C. According to the diagram (Figure 2.15.), the air temperature from January to July is steadily increasing and from August to January it is in decline.

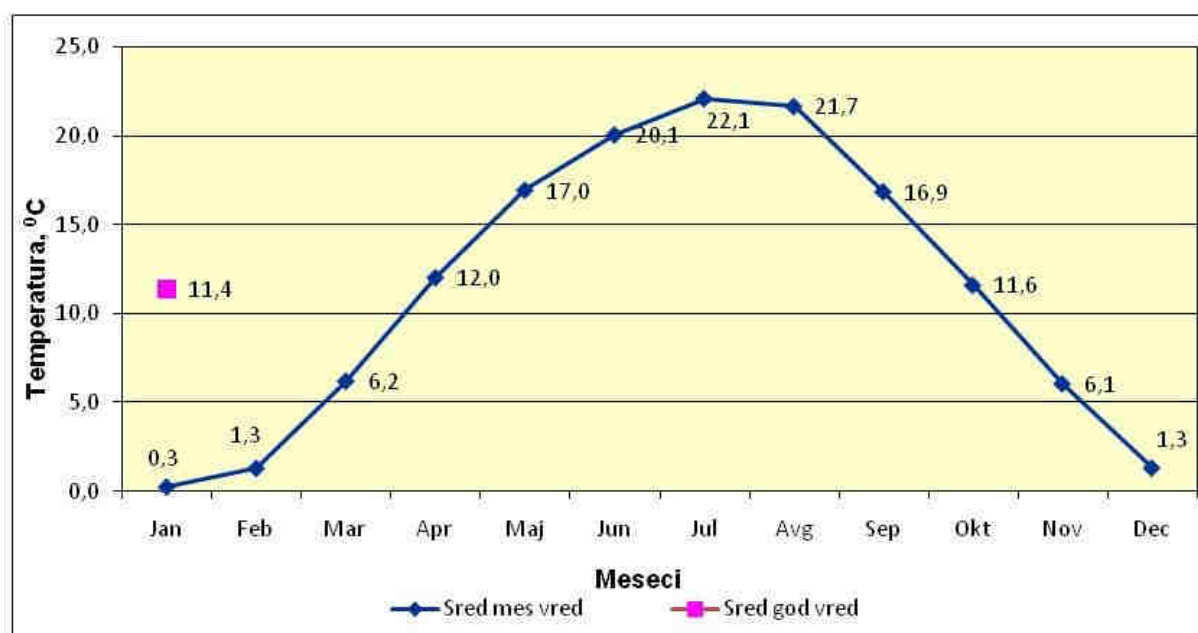


Figure 2.15. Average monthly and average annual air temperature for the period 1983-2012 (meteorological station Veliko Gradiste)

The average monthly spring temperature is slightly below 11 °C, while the autumn is about 15 °C. Temperatures below 0 °C occur between September and May, and between November and March, the average monthly minimum temperature is around -8 °C. The first frosts occur in mid-October, and the last in early April.

Humidity and fog

Relative humidity (expressed in %) represents the ratio between the water vapor content in the air at a certain temperature and the maximum amount of water vapor that the air could receive at the same temperature when it is transferred to the saturated state. The highest values of relative air humidity are in the autumn and winter months and range in the range of 68-85%, and are the lowest in the summer, in the range of 69-71%. The average relative humidity in the ground layers is 75%, so this area is considered to be moderately moist. Comparing the annual changes in relative humidity and air temperature, it is noted that they are inverted proportional.

The number of fog days, which lasts longer than one day, is 19 on average. For more than two days, fog appears on average once every five years. Fog most often occurs in autumn.

Precipitation

In the annual distribution of precipitation, two maximums and two minimums are clearly expressed. The primary maximum occurs in June and the secondary one in September, while the primary minimum occurs in March and the second in November. The average annual precipitation for MS Veliko Gradiste is 641 mm. Characteristics of the climate are also very dry winters with little snowfall. The summer period is characterized by short term and shallow rain. The average number of days in the year with precipitation is 134. The land is on average covered by snow for about 35 days a year, with a height of snow cover from 15 to 30 cm, and a maximum of 60-100 cm.

Wind

Measurement of wind parameters is performed by placing the meteorological masts with measuring instruments which record the data in the so-called. logger and which, other than storage in their own memory, are sent via the mobile telephone network to the e-mail. The data are recorded and sent at time intervals of 10 minutes and based on them, estimates of the wind potential and software simulation of the wind farm production. The data obtained by measurement are the so-called. raw data, that is, they must be analyzed and processed before use in further processes.

On the basis of available data on wind measurements delivered by PE EPS, data from 3 measuring points were obtained: Klenovnik, Drmno and Petka (Figure 2.16).




Legend:	
	The boundary of the zone of interest for instalation of wind farm

Figure 2.16. Existing meteorological masts - shown on the Google Earth map

Comparative review of the frequencies roses and speeds for all three locations are given below.

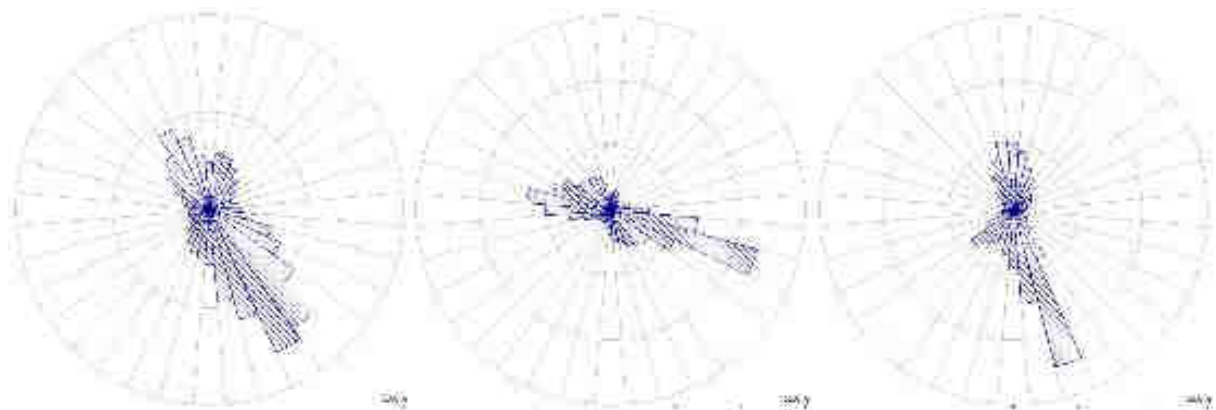


Figure 2.17. Frequency roses for locations Drmno, Klenovnik and Petka (from right to left)

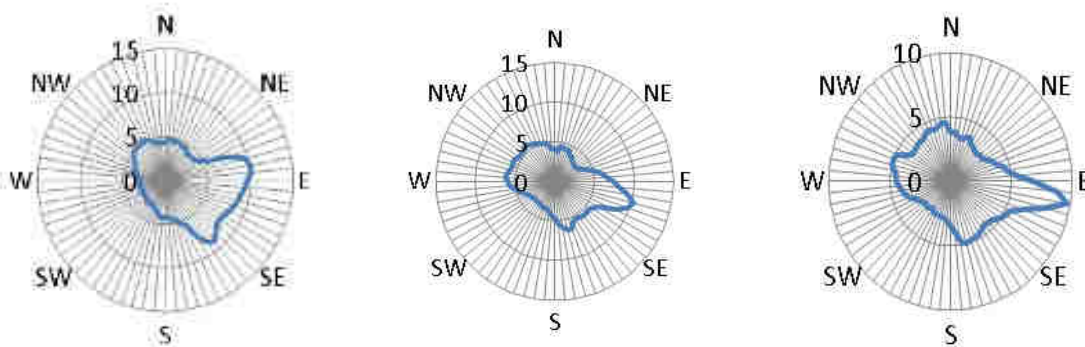


Figure 2.18. Speed roses for locations Drmno, Klenovnik and Petka (from right to left)

The correlation between the measured and predicted mean wind speeds, obtained on the basis of the processed data, is shown in the following graph.

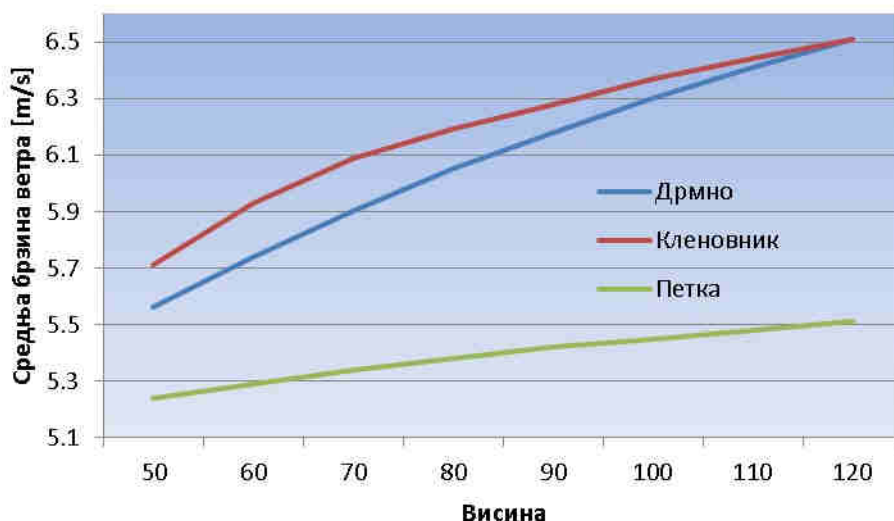
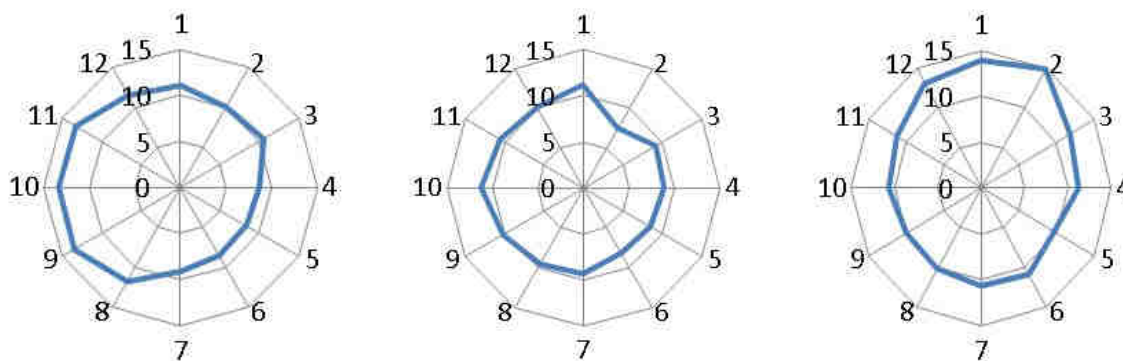


Figure 2.19. Graph of mean wind speeds at different heights for all locations

The display of the intensity of turbulence by sectors is given comparatively for all three locations (Figure 2.20).



Location:	Дрмно	Кленовник	Петка
Medium ambient turbulence intensity [%]	10,80	9,54	11,54

Figure 2.20. Graphic and tabular display of the turbulence intensity - Дрмно (60m), Кленовник (60m) and Петка (50m)

In addition to the elaborated data, there is also an anemometer at the Дрмно location, at height of 120 meters, from which data on air currents that are important for estimating the production of the planned Kostolac wind farm are also collected.

2.2.4. Pedological characteristics

From the pedological point of view, the most widespread types of soil in the wider area of the Kostolac basin are alluvial marsh chernozem, chernozem, cambisol, vertisol and metamorphic vertisol, which belong to the group of climatic and topogenic soils. For the area of the subject location is characteristic of the distribution of vertisol and metamorphic vertisol.

Regarding the location of the planned Kostolac wind farm, it is foreseen in an area that is completely anthropogenically changed due to mining activities. This location is in a pedological sense drastically changed in relation to the former natural characteristics and is dominated by the so-called technogenic land originated mainly by deposited tailings from the surface mines, without significant prudential qualities (Figure 2.21.)

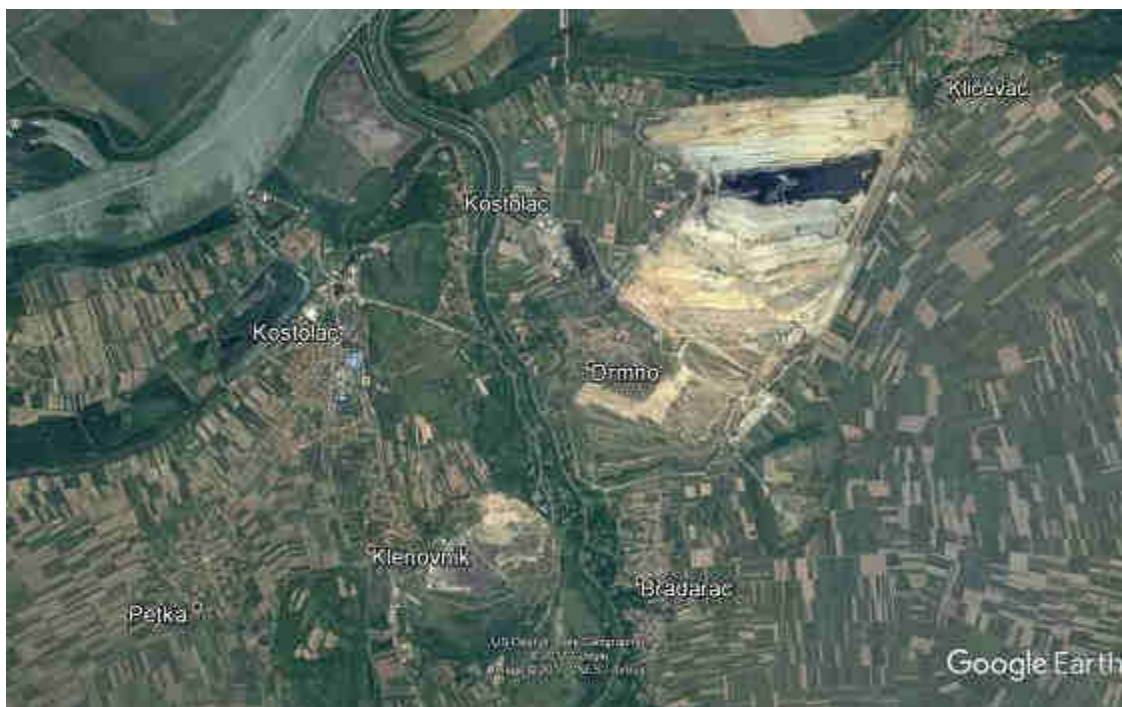


Figure 2.21. Map of the wider area of the Kostolac coal basin (Source: Google Earth)

2.2.5. Seismic characteristics

Based on the seismic map of Serbia (Figure 2.22), this area belongs to the seismic intensity of the 7th degree MCS scale (Mercall-Cancani-Sierberg scale). The following description of manifestations corresponds to this degree: difficulty in standing; breaking of the furniture; minor damage to objects well designed and constructed; small to medium damage on solidly built building structures; significant damage to poorly built or inadequately designed facilities; some chimneys broken; noticeable to persons while driving motor vehicles.

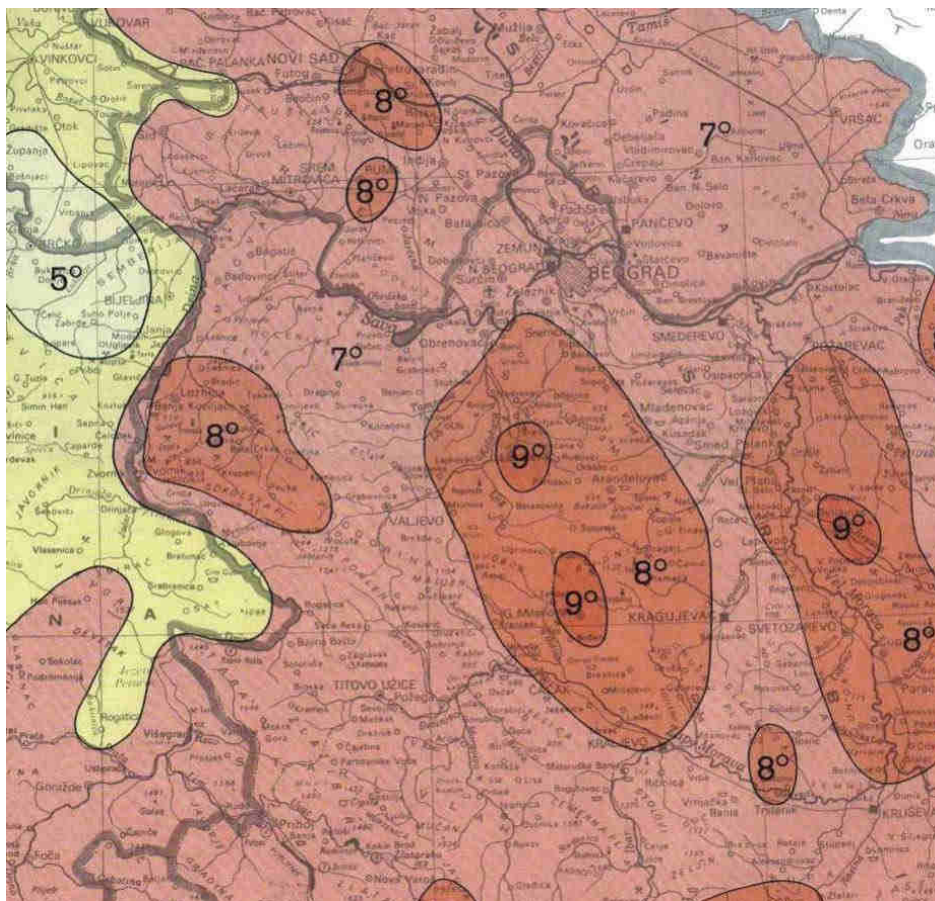


Figure 2.22. Seismological map of Serbia (Regional Map of the Union for Seismology of the SFRY, Belgrade, 1987)

For a detailed analysis of the local soil response to seismic activity, a detailed Seismic micro-regulation of the terrain at the scope of the Project has been done to define project seismic parameters in accordance with the positive regulations of Serbia and Eurocode 8-1. The analyzes were carried out with the aim of defining the parameters of the horizontal elastic spectrum of the local soil response, the corresponding time histories of acceleration and deformable soil properties compatible with the seismic effect on the four microlocation WF Kostolac: Drmno, Klenovnik, Ćirikovac and Petka. The protection of human life as a basic imperative in counter-seismic construction as well as the importance of certain facilities in the functioning of the system of human protection is reflected in the category of importance of objects expressed as a coefficient of significance which indirectly reduces the probability of overcoming and up to 5% in 50 years, that is, increases the period with a risk of 10% in which damage or collapse can occur at 1000 years or more.

The objects that are the subject of designing at the site of wind farm in Kostolac can be classified into the following categories:

- I category objects- wind generators objects (industrial buildings with expensive equipment) with a coefficient $K_0=1.5$,
- II category – industrial buildings that are not clasified as I category (substations, traffic and other objects) with a coefficient $K_0=1.0$.

For the location of the facilities of the wind farm in Kostolac – **locality Drmno** for representative model: for the geodynamic model was defined the seismic hazard at adopted area of local soil according to Serbian standard and 475g according to EN1998-1:

T _{NCR}	PGA (g)
95	0.06
500(475)	0.08
975	0.10

The categorization of objects was carried out in accordance with the Rulebook and standards EN 1998-1 and SRPS EN 1998-6. The categorization has determined that the soil conforms to soft soil according to Serbian standard and according to EN 1998-1 soil type D. The type of spectrum is I based on magnitude of the competent earthquake.

The liquefaction resistance of the local soil is defined using the results of geomechanical investigations, mainly CPT tests. CPT field tests in their essence, represent a continual representation of the change of soil properties along the depth of the geotechnical profile. Altogether 7 CPT tests were performed at Drmno site. By analyzing the data of all 7 CPT experiments, the index of the liquefaction potential values was very low, so its occurrences at the location of the wind farm Kostolac site for location Drmno is low. Analysis of the conditions for the occurrence of liquefaction at the site of wind farm Kostolac-locality Drmno showed that there is no potential for the occurrence of liquefaction. The results of an independent analysis of laboratory and CPT tests are consistent with the existence of conditions for the initiation of liquefaction and, according to the probability of events and the index of the liquefaction potential, the danger is defined as "unlikely".

For the location of the facilities of the wind farm in Kostolac – **locality Klenovnik** for representative model: for the geodynamic model was defined the seismic hazard at adopted area of local soil according to Serbian standard and 475g according to EN1998-1:

T _{NCR}	PGA (g)
95	0.06
500(475)	0.08
975	0.10

The categorization of objects was carried out in accordance with the Rulebook and standards EN 1998-1 and SRPS EN 1998-6. The categorization has determined that the soil conforms to soft soil according to Serbian standard and according to EN 1998-1 soil type D. The type of spectrum is I based on magnitude of the competent earthquake.

Altogether 6 CPT tests were performed at Klenovnik site. By analyzing the data of all 6 CPT experiments, the index of the liquefaction potential values was very low, so its occurrences at the location of the wind farm Kostolac site for location Klenovnik is low. Analysis of the conditions for the occurrence of liquefaction at the site of wind farm Kostolac-locality Klenovnik showed that there is no potential for the occurrence of liquefaction. The results of an independent analysis of laboratory and CPT tests are consistent with the existence of conditions for the initiation of liquefaction and, according to the probability of events and the index of the liquefaction potential, the danger is defined as "unlikely".

For the location of the facilities of the wind farm in Kostolac – *locality Ćirikovac* for representative model: for the geodynamic model was defined the seismic hazard at adopted area of local soil according to Serbian standard and 475g according to EN1998-1:

T_{NCR}	PGA (g)
95	0.06
500(475)	0.08
975	0.10

The categorization of objects was carried out in accordance with the Rulebook and standards EN 1998-1 and SRPS EN 1998-6. The categorization has determined that the soil conforms to soft soil according to Serbian standard and according to EN 1998-1 soil type C. The type of spectrum is I based on magnitude of the competent earthquake.

A total of 4 CPT tests were performed at the Ćirikovac site. By analyzing the data of all 4 CPT experiment in 3 cases of very low value of the index of the liquefaction potential were obtained and the high potential at the WG 11 location, and the risk of its occurrence at the location of wind farm Kostolac, the Ćirikovac locality is generally low. The results of an independent analysis of laboratory and CPT test data are inconsistent. One of the reasons is the assumption that the level of groundwater is on the surface of the terrain and the other cause of this certainly lies in the sampling method, continuous and discrete. Analysis of the conditions for the occurrence of liquefaction at the site of wind farm Kostolac- the Ćirikovac locality showed that there is a potential for the occurrence of liquefaction in the existence of conditions for the initiation of liquefaction, and the danger is defined as "very likely" according to the probability of events and the index of the liquefaction potential. Analysis of the liquefaction potential for the location of the wind turbine at the location of Ćirikovac has shown that there is a high probability of ~ 13% for the occurrence of liquefaction. The analysis shows that the last 8 meters to the surface of the terrain are the key to the occurrence of liquefaction, and by the appropriate method of foundation the expected effects of liquefaction on vertical subsidence can be significantly reduced.

For the location of the facilities of the wind farm in Kostolac – *locality Petka* for representative model: for the geodynamic model was defined the seismic hazard at adopted area of local soil according to Serbian standard and 475g according to EN1998-1:

T_{NCR}	PGA (g)
95	0.06
500(475)	0.08
975	0.10

The categorization of objects was carried out in accordance with the Rulebook and standards EN 1998-1 and SRPS EN 1998-6. The categorization has determined that the soil conforms to soft soil according to Serbian standard and according to EN 1998-1 soil type D. The type of spectrum is I based on magnitude of the competent earthquake.

Altogether 3 CPT tests were performed at Petka site. By analyzing the data of all 3 CPT experiments, the index of the liquefaction potential values was very low, so its occurrences at the location of the wind farm Kostolac site for location Petka is low. The results of an independent analysis of laboratory and CPT test data are inconsistent. Cause of this certainly lies in the sampling method, continuous and discrete. Analysis of the conditions for the

occurrence of liquefaction at the site of wind farm Kostolac- the Petka locality showed that there is a potential for the occurrence of liquefaction in the existence of conditions for the initiation of liquefaction, and the danger is defined as "very likely" according to the probability of events and the index of the liquefaction potential. Analysis of the liquefaction potential for the location of the wind turbine 9 at the location of Petka has shown that there is a high probability of ~ 19% for the occurrence of liquefaction. The analysis shows that the last 4 meters to the surface of the terrain are the key to the occurrence of liquefaction, and by the appropriate method of foundation the expected effects of liquefaction on vertical subsidence can be significantly reduced.

The control calculation benchmark for all four micro-locations showed that the proposed parameters of the specific spectrum for the location Kostolac containing the expected spectral acceleration as for distant as well as maximum local earthquakes.

Detailed data on the liquefaction were elaborated in the geotechnical study especially for all four sites of the Kostolac wind farm.

2.2.6. Hydrological characteristics

The hydrographic network is very developed. The main feature of the hydrographic network of the exploration area is the Danube River with the Dunavac, and the tributaries Velika Morava and Mlava (Figure 2.23).

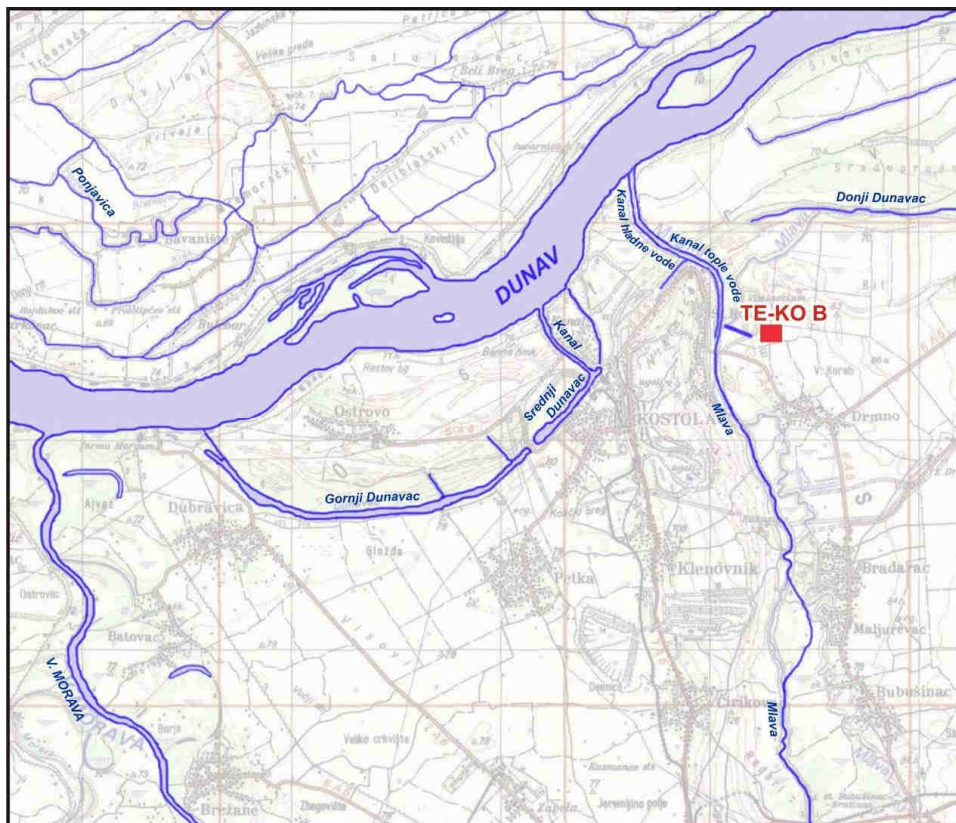


Figure 2.23. A hydrographic map of a wider exploration area

The Danube is about 1200 m wide in the Kostolac area. There are several islands on it: Dubovska ada, Stojkova Ada, Žilovo, Čibuklija, Zavojska. The depth of the Danube in the river bed varies from 7 to 17 m. With the construction of the HPP "Djerdap" the level of the

Danube is raised, the depth is larger and the altitude of the level varies from 69.5 to 70 m. The average annual flow of the Danube is 5.490 cubic meters per second, with a specific yield of 10.4 liters per second per square kilometer. The right bank of the Danube is low and is often flooded. Due to the raising of the Danube level after the construction of the HPP "Djerdap", a system of embankments was built to protect Danube banks from high waters and floods.



Figure 2.24. Hydrographic network of the wider area of the Kostolac wind farm (Source: Google Earth)

The Dunavac (or Little Danube) was previously the right outflow of the Danube, around an island 21 km long and 4 km wide, where the village Ostrovo is located in the upstream part (north of Dubravica and Petka). In recent literature, the Little Danube is called Dunavac and is divided into Upper, Middle and Lower (Figure 2.24). Upper Dunavac (Pecanski Dunavac), 8 km long, is separated from the Danube and Middle Dunavac by embankments. The water regime in the Upper Dunavac is regulated by a pumping station and is maintained at 67.20 m. Middle Dunavac, in the length of 1700 m, is connected with the Channel (also 1700 m long) with the Danube from which its water level depends. Figure 2.53 shows Lower Dunavac and Middle Dunavac. Lower Dunavac, from the confluence of the Mlava River to Klicevac, 12 km long, is practically drained at lower water level. Its riverbed serves as a recipient of surface and groundwater from the surrounding terrain, and the level is regulated by the pumping station at Ram.

Mlava is formed from the Vrelo in the area of Žagubica. Downstream from Petrovac at higher water levels it was waterflow. East of Pozarevac from Mlava separates the left outflow of Orlovača, which is downstream called Mogila. Today Mlava is regulated from Petrovac downstream. With the new riverbed was introduced in the Danube near the Kostolac B thermal power plant. On the right bank there is a protective embankment that is integrated into the Danube protection system. Mlava under the Petrovac is degraded river of altered organoleptic properties with increased content of organic matter. The oxygen regime is corrupted due to the heavy load of the sewage system and the water corresponds to the 4th class of quality. The Mlava basin mostly belongs to the mountain area that is characterized by watercourses with relatively large longitudinal falls. In the basin area upstream from the Gornjak, all watercourses are characterized by very large differences between extremely large

and small waters, and on some watercourses, the ratio Q_{max} and Q_{min} reaches a value of 1000. On the lowest profile (Mogila), which covers 1749 km² or 96% of the territory of the Mlava River basin, the mean annual flow is 12.9 m³/s.

Cold and hot water channels - TEKO-B uses large amounts of cooling water from the Danube (2 x 25.650 m³/h) per block, which is 102,600 m³/h (Figure 2.25).



Figure 2.25. Cold water channel

After cooling, this water is discharged into the Mlava river through the piping system (return cooling water channel) (Figure 2.25). These waters are thermally burdened. In the winter months due to the elevated temperature of water, this part of Mlava at the confluence of the Danube becomes a habitat for many fish species.

Velika Morava flows into the Danube near the village of Dubravica. A typical flatland river, prior to regulation with frequent change of the riverbed, a large number of meander and oxbow lakes. At higher water levels it becomes fast and in the Danube brings in large quantities of sludge, sand and gravel. Due to irregular flow and frequent flooding of the fertile plain, the regulation of the riverbed was carried out. Velika Morava River is distinguished by the surface of a 37,444 km² basin, an average annual flow of 257 m³/s and a specific outflow of up to 6.7 l/s/km². The smallest registered flow rate is 25 m³/s and a maximum of 2,350 m³/s. Stream of Velika Morava has a serious problem of sedimentation (approx. 8,735x10³ tons per year).

2.3. Overview of species of birds and bats of the study area and surroundings

On the basis of one-year observations of ornithofauna and hiropterofauna in the area planned for the construction of the wind farm at the site Kostolac, concrete data on the number and types of flying fauna in the wind farm area and in the wider surroundings were obtained.

2.3.1. Results of one-year ornithofauna monitoring

In the entire research area from December 2014 to November 2015, the monitoring carried out in total showed the presence of representatives of 120 species of birds (Tables 2.1 and

2.2). Representatives of many of the recorded species were present in extremely small numbers. Of the listed number of species, 17 are classified as target species in terms of their national and international importance and status of conservation and protection, as well as on the basis of susceptibility to the risk of collision with wind turbines due to their specific bionomy, behavior, route and height of flying and eventual disturbance of habitat by building wind turbine infrastructure.

Table 2.1 List of all types of birds whose members were recorded (mark +) at locations of the potential wind farm Kostolac and observation points.

No.	Species	Nesting	OP1	OP2	OP3	OP4	OP5	OP6	OP7
1	<i>Cygnus olor</i>				+				
2	<i>Anas platyrhynchos</i>	c	+						
3	<i>Coturnix coturnix</i>	c	+	+	+	+	+		+
4	<i>Phasianus colchicus</i>	c	+	+	+	+	+		+
5	<i>Perdix perdix</i>	c		+		+	+		+
6	<i>Tachybaptus ruficollis</i>	c				+			
7	<i>Phalacrocorax carbo</i>		+	+	+	+			
8	<i>Casmerodius albus</i>		+						
9	<i>Ardea cinerea</i>		+	+	+	+			+
10	<i>Ciconia nigra</i>						+		
11	<i>Ciconia ciconia</i>		+	+	+				+
12	<i>Pernis apivorus</i>			+					
13	<i>Circus cyaneus</i>		+		+	+	+		
14	<i>Circus pygargus</i>			+					
15	<i>Circus aeruginosus</i>		+	+	+	+	+	+	
16	<i>Accipiter gentilis</i>	p		+					+
17	<i>Accipiter nisus</i>	p	+		+	+	+	+	+
18	<i>Haliaeetus albicilla</i>								+
19	<i>Buteo buteo</i>	c	+	+	+	+	+	+	+
20	<i>Falco columbarius</i>				+				
21	<i>Falco vespertinus</i>						+		
22	<i>Falco subbuteo</i>	p	+	+	+	+		+	
23	<i>Falco tinnunculus</i>	c	+	+	+	+	+		+
24	<i>Grus grus</i>		+						
25	<i>Crex crex</i>	c				+			
26	<i>Gallinula chloropus</i>	c				+			
27	<i>Larus ridibundus</i>		+	+	+	+		+	
28	<i>Larus canus</i>					+			
29	<i>Larus michahellis</i>		+	+	+	+	+	+	
30	<i>Columba livia f. domestica</i>	c	+	+	+	+		+	

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No.	Species	Nesting	OP1	OP2	OP3	OP4	OP5	OP6	OP7
31	<i>Columba palumbus</i>	c	+	+	+		+		+
32	<i>Streptopelia decaocto</i>	c	+	+	+	+	+		
33	<i>Streptopelia turtur</i>	c	+	+	+	+	+	+	+
34	<i>Cuculus canorus</i>	c	+	+		+			+
35	<i>Athene noctua</i>	c				+			
36	<i>Otus scops</i>	p		+					
37	<i>Asio otus</i>	c		+*	+*		+*		+*
38	<i>Strix aluco</i>	p		+*		+*			+*
39	<i>Caprimulgus europaeus</i>				+*				
40	<i>Apus apus</i>		+	+	+	+	+		
41	<i>Merops apiaster</i>	c	+	+	+	+	+	+	+
42	<i>Upupa epops</i>	c	+		+	+		+	
43	<i>Jynx torquilla</i>	c	+						+
44	<i>Picus viridis</i>	p	+	+				+	+
45	<i>Dendrocopos major</i>	c	+	+	+	+	+	+	+
46	<i>Dendrocopos medius</i>	c	+						+
47	<i>Dryobates minor</i>	c	+			+	+	+	+
48	<i>Oriolus oriolus</i>	c	+	+		+		+	+
49	<i>Lanius minor</i>	p				+	+		+
50	<i>Lanius collurio</i>	c	+	+	+	+	+	+	+
51	<i>Lanius excubitor</i>		+	+	+	+	+	+	+
52	<i>Pica pica</i>	c	+	+	+	+	+	+	+
53	<i>Garrulus glandarius</i>	p	+	+	+	+		+	+
54	<i>Coloeus monedula</i>		+		+	+			
55	<i>Corvus frugilegus</i>		+			+	+		+
56	<i>Corvus corone/cornix</i>	c	+	+	+	+	+	+	+
57	<i>Corvus corax</i>	c	+	+	+	+		+	
58	<i>Parus caeruleus</i>	c	+	+	+	+	+	+	+
59	<i>Parus major</i>	c	+	+	+	+	+	+	+
60	<i>Parus palustris</i>	c	+	+				+	+
61	<i>Lullula arborea</i>	c	+	+	+	+	+	+	+
62	<i>Alauda arvensis</i>	c		+	+	+	+		+
63	<i>Riparia riparia</i>	c	+	+	+	+		+	+
64	<i>Hirundo rustica</i>	p	+	+	+	+	+	+	+
65	<i>Delichon urbicum</i>	p	+	+	+	+		+	+
66	<i>Aegithalos caudatus</i>	c	+	+	+		+	+	+

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No.	Species	Nesting	OP1	OP2	OP3	OP4	OP5	OP6	OP7
67	<i>Phylloscopus sibilatrix</i>		+						
68	<i>Phylloscopus trochilus</i>		+	+	+	+	+	+	+
69	<i>Phylloscopus collybita</i>		+	+	+	+	+	+	+
70	<i>Acrocephalus arundinaceus</i>	c	+			+			+
71	<i>Hippolais icterina</i>			+					
72	<i>Sylvia atricapilla</i>	c	+	+	+	+	+	+	+
73	<i>Sylvia borin</i>				+			+	+
74	<i>Sylvia nisoria</i>	c	+	+	+	+		+	+
75	<i>Sylvia curruca</i>	p	+	+	+	+	+	+	+
76	<i>Sylvia communis</i>	c	+	+	+	+	+	+	+
77	<i>Regulus regulus</i>		+					+	
78	<i>Sitta europaea</i>	c	+	+					
79	<i>Certhia brachydactyla</i>	p		+				+	
80	<i>Troglodytes troglodytes</i>	c	+	+					+
81	<i>Sturnus vulgaris</i>	c	+	+	+	+	+	+	+
82	<i>Turdus viscivorus</i>		+	+	+	+	+		+
83	<i>Turdus merula</i>	c	+	+	+	+		+	+
84	<i>Turdus pilaris</i>		+	+	+	+	+		+
85	<i>Turdus philomelos</i>	c	+	+	+	+	+	+	+
86	<i>Muscicapa striata</i>	p	+	+				+	+
87	<i>Ficedula hypoleuca</i>		+						+
88	<i>Ficedula albicollis</i>		+	+					+
89	<i>Saxicola rubetra</i>		+	+	+		+		+
90	<i>Saxicola rubicola</i>	c	+	+	+	+	+		+
91	<i>Erithacus rubecula</i>	c	+	+	+	+		+	+
92	<i>Luscinia luscinia</i>			+					
93	<i>Luscinia megarhynchos</i>	c	+	+	+	+	+	+	+
94	<i>Phoenicurus ochruros</i>	c	+	+				+	+
95	<i>Oenanthe oenanthe</i>	p	+		+				
96	<i>Prunella modularis</i>			+					
97	<i>Passer domesticus</i>	c		+	+	+	+		+
98	<i>Passer montanus</i>	c	+	+	+	+	+		+
99	<i>Anthus campestris</i>	p	+	+		+	+	+	
100	<i>Anthus trivialis</i>	c	+	+	+	+	+	+	+
101	<i>Anthus pratensis</i>		+	+	+	+	+	+	+
102	<i>Anthus spinoletta</i>		+	+	+			+	